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ABSTRACT

This volume of the report presents criterion-referenced tests developed to assess student achievement in classes whose teachers did or did not use curriculum guides (developed in phase 1 of this project) for instructional decisionmaking. A total of 44 tests are included in the following career preparation areas: agricultural equipment and mechanics (8 tests), agricultural products--food processing (5 tests), ornamental horticulture (13 tests), agricultural resources (8 tests), forestry (6 tests), and environmental protection (4 tests). Each test is preceded by a statement of student performance objectives for the unit and is followed by a table which presents the correct test answers, results of the final item analysis, test reliability, and number of tests given. Information provided for each item includes relative difficulty, Phi coefficient, point biserial coefficient, and discrimination index. (Author/RG)

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APPENDIX D

Final Report

Project No. V257018
Contract No. OEG-0-72-4677

CURRICULUM DEVELOPMENT BASIC TO THE TRAINING OF INDIVIDUALS FOR EMPLOYMENT IN AGRIBUSINESS, NATURAL RESOURCES, AND ENVIRONMENTAL PROTECTION

Curriculum Development Project
in Vocational Education
Conducted Under
Part I of Public Law 90-576

Dr. Roger Roediger, Project Director
(June, 1972 - June, 1974)
Dr. Max B. McGhee, Project Director
(June, 1974 - September, 1975)
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(September, 1975 - June, 1976)

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U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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June 14, 1976

VOLUME FIVE OF FIVE VOLUMES

VT 103 206

CE008574

LIST OF UNITS
APPENDIX D

Career Preparation Units

Agricultural Equipment and Mechanics
- Agricultural Equipment and Mechanics Salesmanship and Selling
- The Compression System of Single Cylinder Engines
- The Gasoline Fuel System
- The Electrical System
- Assembly, Adjustment, Repair and/or Service of Labor Saving and Materials Handling Equipment
- Agricultural Equipment and Body Reconditioning
- The Cooling System
- Assembly, Adjustment, Repair and Service of Planting Equipment

Agricultural Products (Food Processing)
- Storing Food Products
- Stunning, Shackling and Bleeding Livestock
- Identifying and Cutting Wholesale and Retail Beef Cuts
- Cleaning and Sanitizing Milk Tankers
- Grading Live Poultry

Ornamental Horticulture
- Identification and Selection of Trees and Shrubs
- Pruning Trees, Shrubs and Hedges
- Planting Media Preparation
- Arranging and Designing with Flowers and Decorative Materials
- Grafting and Budding
- Maintaining Turf Fertility
- Turf Weed Control
- Landscape Insect and Disease Control
- Use and Characteristics of Flowers
- Landscape Site Preparation
- Propagation by Cuttings
- Selecting Turf Grasses
- Fish Management in Lakes, Ponds and Streams

Agricultural Resources
- Tree Identification
- Forest Mensuration
- Establishing an Outdoor Recreation Enterprise
- Land Use Classification and Conservation Practices
- Elementary Surveying
- Water Supply and Quality Determination
- Wildlife Identification and Population Management
- Soil Fertility Management

- Forestry
  - Chain Saw Maintenance
  - Establishing the Forest
  - Timber Management Practices
  - Felling, Limbing, and Bucking Trees with the Chain Saw
  - Christmas Tree Production
  - Scaling and Grading Lumber

- Environmental Protection
  - Water Sources and Uses
  - Collection of a Water Sample
  - Flow Measurement (Water Treatment Plants)
  - Wastewater Facilities

AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: Agricultural Equipment and Mechanics Salesmanship and Selling

Student Performance Objectives

The student should be able to:

1. While working in the agricultural equipment dealership, handle the objections and complaints of a customer to the satisfaction of the teacher and/or employer.
2. While working in the agricultural equipment dealership, fill out the appropriate sales forms used by the business to the satisfaction of the employer.
3. While working in the agricultural equipment dealership, advertise and display items for sale in a manner acceptable to the teacher and/or employer.
4. Upon the request of the teacher, define substitute selling and related selling and complete a washout sheet at a level of performance acceptable to the teacher.
5. While working in the agricultural equipment dealership, meet prospective customers and conduct a sales presentation to the satisfaction of the teacher and/or employer

AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: Agricultural Equipment and Mechanics Salesmanship and Selling (3-1)

1. If a customer says "This shovel is too heavy, a sales person should:

   A. emphasize service
   B. show similar items of different price ranges
   C. admit to the objections but show other features
   D. show other shovels

2. The signature of the buyer is necessary on a sales receipt when the purchase payment is:

   A. put on a monthly charge account
   B. paid with a pay-roll check
   C. paid by cash
   D. paid with a personal check

3. A statement of understanding which contains an accurate estimate of figures involved in a business sale but is not an order to purchase equipment is called:

   A. trade agreement
   B. purchase order
   C. washout sheet
   D. bill of lading

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4. Mr. John Farmer is allowed $1,000 for a model "A" tractor which he traded in for a new model "75". The model "A" is in turn sold to Mr. Roberts who traded in his old model "B". How would the machinery dealer's transaction for Mr. Farmer's model "A" tractor be recorded on a wash-out sheet?

A. sale of new or original equipment
B. purchase of new or original equipment
C. first trade-in
D. second trade-in

5. When working in a farm supply store a farmer asks you what varieties of wheat are recommended for the area. How would you answer the question?

A. ask him what variety he grew last year and recommend that he use it again this year
B. check a reference book at the store (such as the Agronomy Guide)
C. tell him that you are sorry but that you do not know
D. tell him that he will have to check with the agriculture teacher or county agent to get that kind of information

6. A good sales person should know there are times when a customer's objection must be accepted and forget about the sale.

A. true
B. false

7. Which of the following products would an Agriculture Supply Store advertise during the month of August?

A. seed oats
B. seed wheat
C. early order fertilizer
D. atrazine

8. A record of transactions of traded-in equipment which aids a dealer in determining if each deal is making a profit is called a(an):

A. washout record
B. purchase order
C. invoice
D. bill of lading

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9. A sales person who wants to improve in salesmanship ability should:

A. ask a friend to come by and offer advice
B. not let the employer know that he wants help in becoming a better sales person
C. not tell anyone, but get more experience in selling
D. ask the employer for suggestions for becoming a better sales person

10. If an employee should ruin a sales ticket for any reason:

A. the word VOID should be written across the front of the ticket and the original placed with the other tickets
B. it should be marked VOID and all copies torn up and destroyed
C. the ruined copies should be given to the customer along with correct copies
D. merely throw away all copies and write up a new ticket

11. Which of the following is the most important concern in window displays?

A. to bring customers into the business
B. to show customers how to use products
C. to make use of surplus items
D. to display items to be donated to the Salvation Army

12. What is meant by over-selling?

A. give the customer a little more of the product than he paid for
B. continue to talk about product after the customer has decided to buy
C. selling the customer two items when he wants only one
D. charging more than the original price of the product

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13. Cash discounts are those discounts which are given a customer for:

A. buying in large quantities
B. bulk purchases
C. buying early in the season
D. paying cash when the purchase is made

14. What is out-of-store advertising?

A. arranging some products in front of the store in the summer
B. advertising through newspapers, TV, direct mail and roadsigns
C. using large posters and attractive signs at key spots around the merchandise in the store
D. advertising that prices are reduced because merchandise is being discontinued or store is going out of business

15. A good rule for a salesperson in an agricultural business firm to follow is "All shoplifters look alike".

A. true
B. false

16. Which of the following should not be used by a good sales person when handling customers' sales objections?

A. give a long and informative reply
B. know when to stop talking
C. get at the real problems
D. use a low-pressure sales approach

17. A definite, legal contract for purchase of machinery which includes the financial arrangements as well as the sale agreement is known as:

A. sales quotation
B. purchase order
C. perpetual inventory
D. warranty report

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18. A good salesperson suggests purchases of related items.

A. true
B. false

19. Display advertising is used to attract the customer's attention since people learn more through their sense of sight than any other sense.

A. true
B. false

20. The first thing a salesperson has to sell is:

A. his/her school
B. himself/herself
C. his/her experience
D. products

21. A purchase paid for by a check:

A. should be considered a charge sale
B. should be considered a cash sale
C. would be recorded as an account receivable
D. cannot be used for discounted items

22. A classified ad which is one column wide and 3 inches long costs $6.60. The advertisement rate for this is:

A. $2.20 per column
B. $3.30 per column
C. $2.20 per column inch
D. $3.30 per column inch

23. What is more likely to happen when a customer is high pressured?

A. the customer thinks something is wrong and becomes cautious
B. the customer will buy more quickly
C. the customer shows more interest in the product
D. the customer likes high pressure selling

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24. If a sales tax is to be added to a purchase this should be calculated:

A. before any delivery charges are added to a sales ticket
B. only after all delivery and bills for other services have been added
C. on all items purchased regardless of their use
D. on the wholesale value of the purchased item

25. The costs for advertising on the local TV station are as follows

	60 seconds	30 seconds	20 seconds	10 seconds
Spot buys:	4:00 p.m. to 8:00 p.m.			
Class A	$15.00	$12.00	$ 9.00	$ 6.00
	8:00 p.m. to sign-off			
Class B	$12.00	$ 9.00	$ 6.00	$ 3.00
	Sign-on to 4:00 p.m.			
Class C	$10.00	$ 8.00	$ 4.00	$ 2.00

Minimum order: 10 spots

Using this information a 10-second spot at 7:00 p.m. and 10:00 p.m. for 7 days would cost

A. $84.00
B. $72.00
C. $63.00
D. $42.00

26. When a sale is made and charged it should be recorded as:

A. an account receivable
B. investment credit
C. account credit
D. a deposit slip

END OF TEST

TABLE: 3-1 S
AREA: Agricultural Equipment and Mechanics
TEST NO.: 3-1
KUDER-RICHARDSON 20: .66[illegible]
KUDER-RICHARDSON 21: .593

N(tests) = 18

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.611	-.156	-.021	-10.0
2.	A	.667	.918	.448	60.0
3.	A	.778	.918	.465	60.0
4.	C	.444	.156	.148	10.0
5.	B	.500	.661	.331	35.0
6.	A	.500	.990	.504	80.0
7.	B	.333	-.249	.071	-15.0
8.	A	.778	-.094	.085	-5.0
9.	D	.111	.718	.402	25.0
10.	A	.889	.000	-.081	00.0
11.	A	.333	.094	.346	5.0
12.	B	.444	.988	.496	75.0
13.	D	.556	-.156	-.148	-10.0
14.	B	.333	.988	.590	75.0
15.	B	.500	.861	.475	55.0
16.	A	.833	.800	.341	40.0
17.	B	.556	.990	.489	80.0
18.	A	.444	.156	.119	10.0
19.	A	.556	-.156	.113	-10.0
20.	B	.500	.988	.504	75.0
21.	B	.722	.990	.676	80.0
22.	C	.333	.988	.560	75.0
23.	A	.556	.000	.750	100.0
24.	A	.833	.800	.341	40.0
25.	C	.611	.661	.303	35.0
26.	A	.889	.625	.010	20.0
27.					
28.					
29.					
30.					

AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: The Compression System of Single Cylinder Engines

Student Performance Objectives

The student should be able to:

1. When presented with various parts of the compression system in a small gasoline engine, correctly identify all the parts and describe the function of the part in the compression system to the satisfaction of the teacher.

2. When given a small gasoline engine with operating symptoms that may be caused by defects in the compression system, diagnose the nature of the malfunction(s) following approved troubleshooting procedures.

3. When provided with a small gasoline engine with defects in the compression system, disassemble the engine, repair and/or service, reassemble, and adjust the parts needing repair or service according to the manufacturer's specifications.

AREA: AGRICULTURAL MECHANICS

Unit: The Compression System of Single Cylinder Engines
(3-2)

1. In a 2-cycle engine the fuel air mixture which is passing into the cylinder during the intake stroke has just prior to this been contained in the:

A. piston
B. crankcase
C. gas tank
D carburetor

2. A practical and accurate means for checking compression on a single cylinder engine is to:

A. remove spark plugs and check with a compression gauge
B. hand-spin fly wheel against the compression stroke and not the rebound
C. use torque wrench on fly wheel to measure pounds of resistance to turning
D. use vacuum gauge at air intake of carburetor

3. A newly honed cylinder should have:

A. a very smooth surface
B. a coarse surface
C. a surface with a cross-hatched honing pattern
D. a surface with a horizontal honing pattern

4. The oil ring on a small engine is:

A. always the top ring on the piston
B. always the lowest ring on the piston
C. placed in any of the piston grooves
D. always placed in the middle groove

5. In 4 stroke cycle small engines the most probable source of low compression is:

A. bad valve(s)
B. carburetor out of adjustment
C. bad spark plugs
D. partially blocked exhaust ports

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6 The space in the cylinder when the piston is at the top of the stroke compared to when it is at the bottom of the stroke is called:

A. piston displacement
B. cubic inches
C. valve head margin
D. compression ratio

7. In order to provide a good seal for compression within the cylinder, the piston:

A. is equipped with compression ring(s)
B. is tapered so that it works like a cork in a bottle
C. is equipped with an oil ring which seals off the small air gaps with oil
D. is tightly fitted so no fuel or gas can escape even if no piston rings were used

8 In checking a cylinder for wear we should check for:

A. diameter and taper
B. out of round and taper
C. diameter, taper and out of round
D. diameter only

9. A cross-hatch appearance from honing the finish of a resized cylinder:

A. should be ground further until finish is smooth
B. indicates that the honing stone was too coarse
C. is purposely done to tell if honing depth is consistant
D. is done to allow proper lubrication and break-in

10. In checking over 4-cycle engine, when you turn the engine over slowly, compression gas is heard escaping during the:

A. compression stroke, indicating that there is a problem with either the piston ring(s) and/or piston
B. intake stroke, indicating that there is a problem with the valves
C. compression stroke, indicating that there is a problem with the valves
D. intake stroke, indicating that a piston ring may be defective

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11. The clearance between the piston and the cylinder wall provides for:

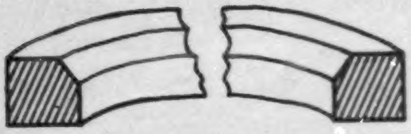
A. expansion of metals
B. space for air-fuel mixture to enter cylinder
C. prevention of over compression
D. blow by

12. In torquing cylinder head bolts:

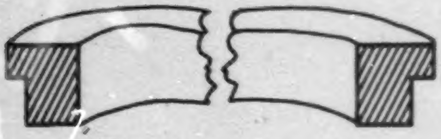
A. all small engine heads are torqued to the same specifications
B. cast iron heads are torqued to lesser inch/lbs. than aluminum heads
C. aluminum heads are torqued with a special torque wrench
D. torquing should be done to manufacturer's specifications

13. The compression ring for a piston can be identified by the shape:

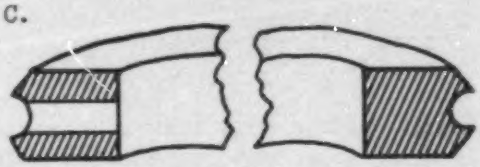
A.



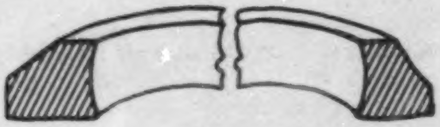
B.



C.



D.



14. The cylinder bores in a worn engine block generally show the most wear

A. outside the area of piston travel
B. near the top of the area of piston travel
C. near the bottom of the area of piston travel
D. on the "ridge"

15. The crankcase of a 2-cycle engine is sealed or air tight so that

A. it is easier to cool the engine
B. the oil won't leak out
C. it keeps dirt and dust off the breaker points
D. it functions as part of the intake system

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16 When checking for cylinder wear the engine cylinder diameter is measured in at least six place with:

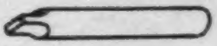
A. an inside micrometer
B. a cylinder wear-gauge
C. inside caliper
D. both A and C
E. both A and B

17. The correct order of strokes for a four stroke cycle engine is:

A. intake, compression, exhaust, power
B. intake, compression, power, exhaust
C. intake, power, compression, exhaust
D. intake, power, exhaust, compression

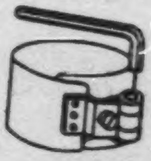
18. The tool shown is a:

A. valve guide gauge
B. plungers bushing driver
C. cutter shank
D. T-handle



19. The tool shown is for:

A. compressing valve springs
B. holding the flywheel
C. guiding honing stone for cylinder rebore
D. compressing piston rings



END OF TEST

AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: The Gasoline Fuel System
(3-3)

1. When the gravity type fuel system on a small engine is not providing fuel into the cylinder and there is gasoline in the tank, the first step in locating the probable cause would be to find out if:

A. the intake valve is stuck in the closed position
B. the main jet is adjusted correctly
C. the fuel line is clear
D. carburetor bowl is full of gasoline

2. When using a carburetor repair kit it is recommended to:

A. use all of the new parts in the kit
B. use only those parts which were found to be defective
C. soak all parts in oil before using
D. retune the distributor

3. If air leaks at the manifold connections and around the carburetor gaskets cannot be stopped by tightening the fittings then:

A. the rim of the carburetor should be ground down
B. the gaskets should be replaced
C. the carburetor vacuum should be reduced
D. gasket sealer should be used at all carburetor connections

4. If a tractor is giving off black smoke from the exhaust pipe when under a heavy load, the fuel mixture is:

A. too lean
B. too rich
C. just right
D. can't tell from this information

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5. Turning the full-load adjusting screw of the carburetor clockwise will:

A. give a leaner mixture of fuel to the engine
B. cause engine to smoke
C. cause the engine to run cooler
D. provide more air to the carburetor

6. Carburetor adjustment should always be made:

A. when the engine is cold
B. with a full tank of fuel
C. for full-load fuel mixture with motor under load
D. for full-load first and for idle speed last

7. In a suction type carburetor the fuel tube can be checked for restrictions (blockage) by:

A. blowing air through it from the screen end
B. blowing air through it from the end opposite the screen
C. blowing air through it either way
D. hold it up to a light and visually check the tube for restrictions

8. Carburetor adjustment is recommended:

A. during engine tune-up
B. after major overhaul of the engine
C. whenever the carburetor has been removed for service
D. for all of the above

9. If a tractor does not have a tachometer to check the idling speed, it may be measured with a portable tachometer at the:

A. wheel axle
B. cam shaft
C. generator
D. power take-off shaft

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10. If when checking the carburetor float needle, valve, and seat you observe a groove worn around the valve, what should you do?

    A. ignore it
    B. replace the seat
    C. replace the valve
    D. replace both valve and seat

11. If screws which hold the throttle disc in place are not tightened securely it is possible that they:

    A. may be drawn into the combustion chamber by engine suction
    B. may jam under the float and flood the carburetor
    C. may plug the fuel inlet to the carburetor bowl
    D. may cause problems when draining fuel from the carburetor bowl

12. The adjustment of the idling speed of a tractor engine should be done

    A. when engine has warmed to operating temperature
    B. while the tractor is moving
    C. while the engine is cold
    D. before setting the breaker point gap

13. Suppose when checking the fuel system on a gasoline tractor you remove the air cleaner and find that the high-speed nozzle is discharging gasoline while the engine is idling. What is the probable cause?

    A. the idle speed set too high
    B. the high-speed needle valve is open too far
    C. the high-speed needle valve is closed too far
    D. the float level is too high

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14 The usual cause(s) of carburetor flooding is(are):

A. dirt on float valve seat
B. leaking float
C. excessive fuel pump pressure
D. all of the above

15. Most carburetors are vented for the purpose of:

A. preventing damage from high pressures during backfiring
B. excessive fuel pump pressure
C. compensate for difference in vacuum between idle speeds and heavy loads
D. avoid vapor lock problems

16. The purpose of an acceleration pump in a carburetor is to:

A. pump in extra fuel prior to starting in cold weather
B. mix proper amounts of fuel and air under all operating conditions
C. provide greater air velocity for extreme acceleration
D. provides extra fuel during rapid acceleration

END OF TEST

TABLE: 3-2 S
AREA: Agricultural Equipment and Mechanics
TEST NO.: 3-2
KUDER-RICHARDSON 20: .714
KUDER-RICHARDSON 21: .579

N(tests) = 12

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	B	.333	.969	.680	66.7
2.	B	.917	-.790	-.422	-33.3
3.	C	.167	.790	.313	33.3
4.	B	.000	.000	.000	00.0
5.	A	.000	.000	.000	00.0
6.	D	.250	.969	.539	66.7
7.	A	.250	.000	.808	100.0
8.	C	.250	.790	.471	33.3
9.	D	.167	.969	.626	66.7
10.	C	.333	.000	.742	100.0
11.	A	.333	.000	.928	100.0
12.	D	.167	.969	.626	66.7
13.	A	.167	.790	.548	33.3
14.	B	.500	.141	.058	8.3
15.	D	.083	.790	.422	33.3
16.	E	.250	.000	.000	00.0
17.	B	.083	.790	.422	33.3
18.	A	.750	-.141	.067	-8.3
19.	D	.000	.000	.000	00.0
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

TABLE: 3-2 A
AREA: Agricultural Equipment and Mechanics
TEST NO.: 3-2
KUDER-RICHARDSON 20: .830
KUDER-RICHARDSON 21: .807

N(tests) = 76

Item	Correct Option	Relative Diffi- culty	Phi Coeff- icient	Point Biserial Coefficient	Discrim- ination Index
1.	B	.645	.969	.547	72.3
2.	B	.408	.992	.716	80.5
3.	C	.421	----	.759	95.0
4.	B	.224	.924	.603	60.5
5.	A	.237	.956	.617	65.0
6.	D	.355	.294	.145	17.3
7.	A	.211	.911	.537	55.0
8.	C	.395	.884	.420	55.9
9.	D	.408	.844	.495	51.4
10.	C	.316	.965	.623	70.5
11.	A	.382	----	.666	90.0
12.	D	.197	.911	.560	55.0
13.	A	.526	.918	.506	62.7
14.	B	.553	.911	.413	62.3
15.	D	.474	.941	.471	65.9
16.	E	.579	.397	.272	25.0
17.	B	.171	.827	.502	40.0
18.	A	.632	-.063	.089	-4.1
19.	D	.197	.935	.591	60.0
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

TABLE: 3-3 S
AREA: Agricultural Equipment and Mechanics
TEST NO.: 3-3
KUDER-RICHARDSON 20: .314
KUDER-RICHARDSON 21: -.034

N(tests) = 40

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.200	.780	.432	35.7
2.	A	.275	.876	.301	50.0
3.	B	.050	.294	.329	7.1
4.	B	.450	.990	.660	78.6
5.	A	.775	-.836	-.454	-42.9
6.	C	.950	-.411	-.271	-14.3
7.	A	.750	.031	.139	2.2
8.	D	.150	.780	.568	35.7
9.	D	.250	.876	.477	50.0
10.	D	.275	.946	.614	64.3
11.	A	.500	.000	.750	100.0
12.	A	.250	.918	.624	57.1
13.	D	.850	-.718	-.176	-28.6
14.	D	.750	-.718	-.183	-28.6
15.	D	.800	-.718	-.210	-28.6
16.	D	.400	.999	.706	85.7
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

TABLE: 3-3 A
AREA: Agricultural Equipment and Mechanics
TEST NO.: 3-3
KUDER-RICHARDSON 20: .557
KUDER-RICHARDSON 21: .420
N(tests) = 20

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	C	.600	.918	.437	63.3
2.	A	.250	.996	.754	80.0
3.	B	.250	.941	.664	60.0
4.	B	.450	.000	.734	100.0
5.	A	.550	.951	.519	66.7
6.	C	.850	.750	.259	33.3
7.	A	.600	.413	.358	30.0
8.	D	.300	.661	.106	20.0
9.	D	.650	-.397	-.133	-23.3
10.	D	.200	.996	.633	80.0
11.	A	.700	.750	.404	33.3
12.	A	.250	.918	.484	63.3
13.	D	.850	.869	.423	50.0
14.	D	.300	-.750	-.149	-33.3
15.	D	.550	.110	.166	6.7
16.	D	.900	.440	.162	16.7
17.					
18.					
19.					
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AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: The Electrical System

Student Performance Objectives

The student should be able to:

1. When provided with an engine and equipment with observable symptoms that may be caused by defects in the starting circuit, the charging circuit, and/or the lighting and accessory circuits, diagnose the nature of the defects by following approved trouble-shooting procedures detailed in the service manual.

2. When provided with equipment with defects or maladjustments in the charging circuit, remove, disassemble, test, inspect, replace, reassemble, and install, according to the procedures in the service manual, the following components of the charging circuit:

   A. generator
   B. voltage regulator
   C. alternator, if the engine is so equipped

3. When provided with equipment with defects or maladjustments in the starting circuit, remove, disassemble, test, inspect, replace, reassemble, and install, according to the procedures in the service manual, the following components of the starting circuit:

   A. starting motor
   B. starting switch
   C. external solenoid

4. When provided with equipment with defects in the lighting and/or accessory circuits, remove, inspect, service, and install, according to the procedures in the service manual. The following components of such circuits:

   A. switches
   B. fuses
   C. wires
   D. gauges

AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: The Electrical System (3-4)

1. A newly assembled tractor engine backfires. Which of the following would you check out first as a possible cause of this malfunction?

A. one spark plug wire bad
B. cracked distributor cap
C. leaking inlet valve
D. improper firing order

2. Never polarize an alternator.

A. true
B. false

3. If the voltage is correct in a lighting circuit but the lamp is dim, a likely cause is:

A. a tripped circuit breaker
B. a blown fuse
C. poor wiring connection between the lamp and the wiring harness
D. low water level in the battery

4 The tractor engine overheats. Which of the following would you check first as a possible cause of this malfunction?

A. ignition timing late
B. spark plugs are bad
C. generator burned out
D. defective coil

GO TO NEXT PAGE

5. When cleaning the regulator contact points, the one type of material which should not be used is:

A. emery cloth or sand paper
B. spoon or riffler file
C. No. 400 grit silicone carbide
D. crocus cloth

6 An appropriate material to clean a starter communtator which has become glazed or dirty is:

A. emery cloth
B. no. 00 sand paper or brush-seating stone
C. a smooth mill file
D. paint solvent

7 Which is an accurate description of an electrical circuit fuse:

A. can be reset without replacement
B. will blow from an overloaded circuit but not from a short circuit
C. less expensive to purchase than a circuit breaker
D. is recommended for installation where frequent blowing of the circuit by heavy electrical loads is expected

8. The tractor engine turns over slowly but will not start. Which of the following would you check out first as a possible cause of this malfunction?

A. generator not functioning
B. defective fuel system
C. run-down battery
D. all of the above

9. The engine will not start and there is no high tension spark coming from the coil. Which of the following would you check out first as a possible cause of this malfunction?

A. spark plugs bad
B. points not adjusted properly
C. distributor cap broken
D. carburetor

GO TO NEXT PAGE

10. To prevent overheating of the starting motor, never operate it for more than ___________ at a time without pausing for awhile.

A. 10 seconds
B. 30 seconds
C. 2 minutes
D. 3 minutes

11. The engine runs but misses. Which of the following would you check out first as a probable cause of this malfunction:

A. distributor cap defective
B. undersized battery cables
C. worn piston pin or bushing
D. low water level in battery

12. A fuse with the glass stained dark is caused by:

A. a quick blowing fuse which has blown from an overload
B. a quick blowing fuse which has blown from a short circuit
C. a slow blowing fuse which has blown from an overload
D. a slow blowing fuse which has blown from a short circuit

13. When you turn the switch on and try to start the engine, nothing happens (doesn't turn over). Which of the following would you check out first as a possible cause of this malfunction?

A. bad distributor
B. points not adjusted properly
C. corroded terminals on battery
D. none of the above

On questions 14-16, match each item on the left with the correct item on the right:

14. during starting

15 during normal operation

16. during peak operation

A. generator supplies all current and recharges battery
B. battery supplies all load current
C. battery helps generator supply current

GO TO NEXT PAGE

17. To find out how much energy is available from the battery, a simple test can be made by:

A. checking the electrolyte level
B. using the hydrometer
C. a trickle charger
D. ohm meter

18. A spark plug with too long of an insulator seat will tend to cause:

A. the plug to run cold and pre-ignition
B. the plug to run hot and late ignition
C. the plug to run cold and fouling
D. the plug to run hot and pre-ignition

19. A spark plug with a short insulator seat:

A. tends to run cooler and should be used for heavy loads or fast speeds
B. tends to run hotter and should be used for light loads or lower speeds
C. tends to run cooler and should be used for light loads or lower speeds
D. tends to run hotter and should be used for heavy loads or faster speeds

20. If a build-up of metal material occurs on the distributor points, a cause of this could be:

A. a condenser which is over-capacity or under-capacity
B. cracked rotor or distributor cap
C. excess voltage due to a faulty regulator
D. too-wide distributor rotor gap

21. Some alternators have a part which acts as an automatic switch to block any current flow from the battery back to the alternator and regulator when the alternator is not operating. This part is a/an:

A. charge indicator light
B. positive diode
C. isolation diode
D. negative diode

GO TO NEXT PAGE

22. A primary difference between a generator and an alternator is that the:

A. alternator rectifies AC to DC current with diodes
B. the generator produces much higher voltages
C. the generator is best for producing current at low idle speed
D. the generator produces AC current

23. The voltage from a 12 volt battery can be increased to a high level voltage at the spark plug of 4,000-20,000 volts in the:

A. condenser
B. distributor
C. alternator or generator
D. coil

24. "Knock" or pre-ignition is caused by:

A. the distributor timing being early
B. the spark plug being badly fouled
C. the valve timing off
D. the distributor timing being late

25. The primary circuit of the electrical system includes the:

A. spark plugs
B. distributor rotor
C. condenser
D. spark plug wires

26. Which of the following combinations would be the appropriate procedure to avoid damage to parts of the electrical system

	when removing the battery	when installing the battery
A.	disconnect ground strap first	connect ground strap first
B.	disconnect ground strap last	connect ground strap first
C.	disconnect ground strap first	connect ground strap last
D.	disconnect ground strap last	connect ground strap last

END OF TEST

TABLE: 3-4 S
AREA: Agricultural Equipment and Mechanics
TEST NO.: 3-4
KUDER-RICHARDSON 20: -.035
KUDER-RICHARDSON 21: -.340

N(tests) = 28

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D	.286	.935	.502	62.5
2.	A	.321	-.294	-.010	-17.9
3.	C	.393	.141	.048	8.9
4.	A	.750	.790	.416	44.6
5.	A	.750	.844	.340	42.9
6.	B	.714	.649	.331	30.4
7.	C	.643	-.110	-.122	-7.1
8.	C	.214	.685	.165	25.0
9.	B	.500	.979	.589	71.4
10.	B	.679	.294	.115	17.9
11.	A	.071	-.440	-.082	-14.3
12.	B	.750	.649	.076	30.4
13.	C	.107	.203	.242	10.7
14.	B	.357	.809	.429	48.2
15.	A	.786	.047	.154	1.8
16.	C	.821	-.685	-.055	-25.0
17.	B	.679	.078	-.060	5.4
18.	D	.893	.440	.128	14.3
19.	A	.786	.740	.194	28.6
20.	A	.821	.309	.116	16.1
21.	C	.429	.637	.373	32.1
22.	A	.714	-.141	-.140	-8.9
23.	D	.607	.780	.354	46.4
24.	A	.571	-.110	-.009	-7.1
25.	C	.821	.309	.244	16.1
26.	C	.679	.999	.535	85.7
27.					
28.					
29.					
30.					

TABLE: 3-4 A
AREA: Agricultural Equipment and Mechanics
TEST NO.: 3-4
KUDER-RICHARDSON 20: .269
KUDER-RICHARDSON 21: -.016

N(tests) = 38

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D	.079	-.426	-.174	-15.4
2.	A	.500	.309	.107	19.9
3.	C	.105	.031	.029	1.3
4.	A	.184	.770	.345	33.3
5.	A	.711	.809	.419	45.5
6.	B	.816	.426	.236	22.4
7.	C	.658	-.172	-.130	-10.9
8.	C	.184	.031	.207	1.3
9.	B	.184	.884	.622	50.0
10.	B	.342	.930	.492	58.3
11.	A	.000	.000	.000	00.0
12.	B	.737	.368	.314	21.8
13.	C	.000	.000	.000	00.0
14.	B	.079	.696	.463	25.0
15.	A	.395	.898	.553	60.3
16.	C	.316	.836	.543	51.3
17.	B	.500	.187	.000	12.2
18.	D	.605	.426	.282	28.2
19.	A	.763	.218	.154	13.5
20.	A	.447	.673	.250	35.3
21.	C	.263	-.218	-.046	-13.5
22.	A	.211	.696	.281	25.0
23.	D	.184	.625	.262	25.6
24.	A	.342	.047	.085	3.2
25.	C	.395	.760	.421	43.6
26.	C	.789	-.031	-.071	-1.3
27.					
28.					
29.					
30.					

AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: Assembly, Adjustment, Repair and/or Service of Planting Equipment

Student Performance Objectives

The student should be able to:

1. When provided with knocked-down planting equipment inspect the bundles for missing parts and assemble the various types of planting equipment according to directions in the operator's instructional manual.

2. When provided with various types of assembled planting equipment, make initial adjustments on the equipment and provide pre-delivery service according to the directions in the operator's instructional manual.

3. When provided with various types of assembled planting equipment, load, deliver and unload assembled planting equipment at the proper customer location with no damage resulting to the assembled equipment.

4. When provided with various types of malfunctioning planting equipment in need of minor repairs or service, make such minor repairs and service according to directions detailed in the operator's instructional manual.

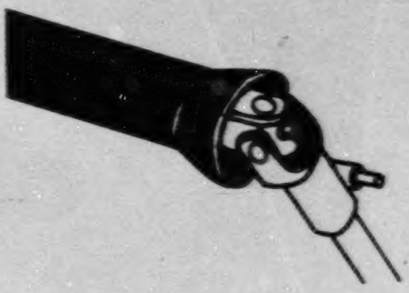
AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: Assembly, Adjustment, Repair and/or Service of Labor Saving and Materials Handling Equipment
(3-5)

1. All other considerations being equal, which of the following belt drives on a grain auger will need to be the tightest?

A. a 2 foot drive with a smooth load
B. a 4 foot drive with a smooth load
C. a 2 foot drive with a pulsating load
D. a 4 foot drive with a pulsating load

2. The part shown in this picture is:



A. a ball joint
B. a multiple flex joint
C. a universal joint
D. a slip shaft coupling joint

3. When tightening the spindle nut [illegible] a front wheel bearing after packing the bearings with new grease, it should be tightened by:

A. applying approximately 25 pounds torque
B. bringing up tight and adding 1/2 turn
C. bringing up tight and backing off 1/2 turn
D. bringing up tight and backing off one turn

4. Which of the following chains are likely to be used in the web of a manure spreader?

A. roller chain
B. pintle chain
C. hook link or detachable link chain
D. convex spur chain

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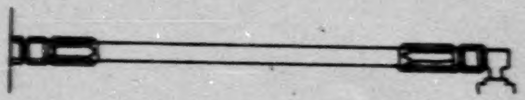
5. Choose the correct statement below about load binders:

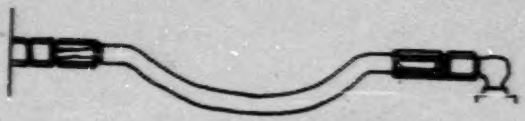
A. they aren't really that important so don't bother with them
B. they should be substantial enough to prevent shifting loads
C. should have a breaking strength equal to one-half the dead weight of the load
D. binders are never used on cleat-type tractors

6. Which one of the following hose installations is correct for hydraulic systems?

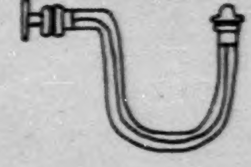
A.



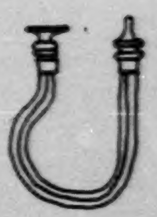
B.



C.



D.



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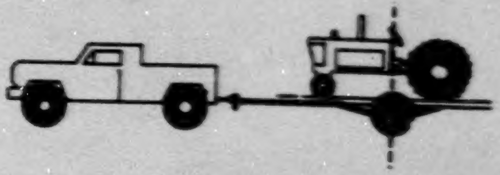
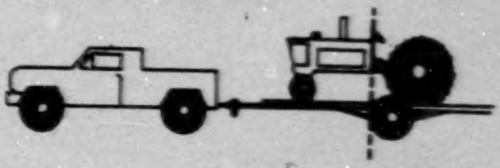
7. For towing purposes it is important to distribute the load weight correctly on the trailer. Choose the sketch below which represents the correct weight distribution for transport.

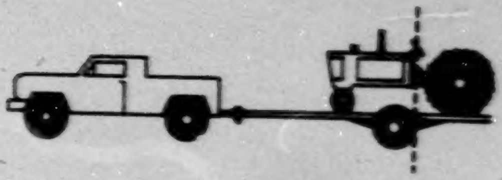
A.



B.



C.



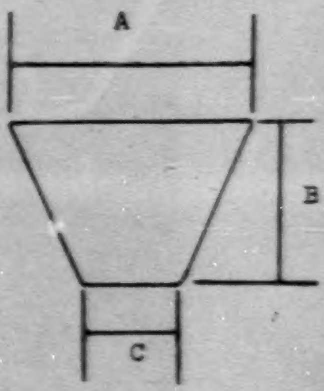
D. none of the above

8. After the spindle nut is properly tightened, normally you would then:

A. replace the dust cover
B. replace the inner seal assembly
C. install a cotter pin
D. replace the tire and wheel

9. The width of a V-belt is the width of:

A.
B.
C.



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10. The driver pulley on your elevator is 4 inches in diameter and runs at 200 RPM. The driven pulley is 8 inches in diameter and runs at:

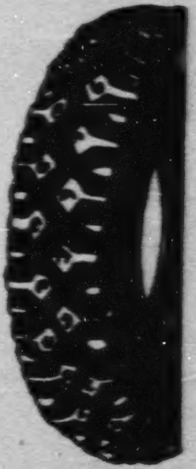
A. 100 RPM
B. 200 RPM
C. 400 RPM
D. 1600 RPM

11. For unloading a crated riding mower from a truck, you should use a:

A. fork lift
B. lift boom
C. wrecker
D. crane

12. The tire illustrated here is used primarily on:

A. mud
B. pavement
C. sand
D. tall grass



13. The driver pulley on your auger is 4 inches in diameter and runs at 250 RPM. The driven pulley on the auger must run at 100 RPM. What size driven pulley is needed?

A. 4 inches
B. 7 1/2 inches
C. 10 inches
D. 12 1/2 inches

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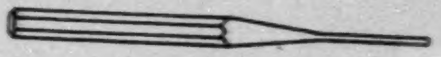
14. A load that extends 8 feet over the rear of the truck should be marked with:

A. red flags
B. yellow flags
C. at least 2 lights
D. all the above

15. The tool illustrated below is

A. a line punch
B. a center punch
C. a pin punch
D. none of the above



16. For unloading an assembled three bottom plow from a truck, you should use a:

A. fork lift
B. lift boom
C. wrecker
D. crane

END OF THE TEST

TABLE: 3-5
AREA: 3-5
TEST NO.:
KUDER-RICHARDSON 20:
KUDER-RICHARDSON 21:

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	C				
2.	C				
3.	C				
4.	C				
5.	B				
6.	B				
7.	B				
8.	C				
9.	B				
10.	A				
11.	A				
12.	B				
13.	C				
14.	A				
15.	C				
16.	B				
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AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: Agricultural Equipment Body Reconditioning

Student Performance Objectives

The student should be able to:

1. Provided equipment to be reconditioned, completely clean the equipment using either air, chemicals, and/or steam by following the directions in the operator's manual for the steam cleaner or other equipment.

2. Provided cleaned equipment to be reconditioned, sand and featheredge the equipment to meet the standards established by the instructor

4. Provided equipment ready for priming, mask or prepare the equipment for priming by other appropriate means suggested by the instructor.

4. Provided equipment ready for priming, apply a primer coat and "rub-out" so that a primer coat is obtained that meets the teacher's approval.

5. Provided equipment ready for painting, apply the finishing coat using spray painting equipment and "touch-up" the equipment when necessary so that a finished coat is obtained that meets the teacher's approval.

6. Provided appropriate spray painting equipment, prepare the equipment for spraying and clean and maintain the spraying equipment by following procedures detailed in the spray gun operator's manual.

AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: Agricultural Equipment and Body Reconditioning (3-7)

1. Which of the following would not likely cause an "orange peel" finish when spray painting equipment?

   A. improper thinner
   B. holding spray gun too far or too close to the object being painted
   C. too low an atomization pressure
   D. paint mixed too much

2. Farmer Brooks is planning to repaint a burned spot on the hood of his tractor. The generally accepted procedures for doing touch-up work on metal are identified below. Which of the following tasks should be done first?

   A. wash the surface; remove all wax and oil
   B. build up sanded area with primer-surfacer
   C. sand until level and perfectly smooth
   D. apply a coat of thinner to smooth out rough spots

3. What is the purpose of the tack rag?

   A. A lintless rag dipped in thin non-drying varnish to test new paint to see if it is firm or tacky
   B. a special rag used for holding upholstery tacks
   C. a special rag used for cleaning spray gun parts
   D. a rag used to wipe dust from the surface immediately before spraying

4. Tape manufacturers caution against applying or removing masking tape below what temperature?

   A. 70°F
   B. 60°F
   C. 50°F
   D. 40°F

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5. When removing masking tape, it should be:

A. pulled directly outward at a 90° angle
B. pulled at a low angle ahead of the part adhering
C. pulled at a low angle behind the part adhering
D. pulled at an angle away from the paint edge

6. Feather edge sanding should be done with what grade paper?

A. no. 16
B. no. 50
C. no. 220
D. no. 320

7. Gasoline is an accepted material to use to remove traces of wax and grease from the surface in preparation for painting.

A. true
B. false

8. To determine whether a surface is finished with nitrocellulose lacquer or with acrylic lacquer, what procedure should be used?

A. rub surface with thinner
B. rub surface with silicone polish remover
C. rub surface with rubbing compound
D. rub surface with a tack rag

9. The most desirable room temperature for spray painting metal is:

A. below 40 degrees F
B. 40 - 50 degrees F
C. 65 - 85 degrees F
D. 110 - 120 degrees F

10. When spraying a flat surface, like the bed of a truck or the top of a cab, overspray can best be made to fall on uncoated work by:

A. starting on the near side and working towards the far side
B. skipping the area of every other stroke on first pattern then doing skipped areas on second pattern
C. 'triggering gun' at end of stroke
D. starting on the far side and working towards the near side

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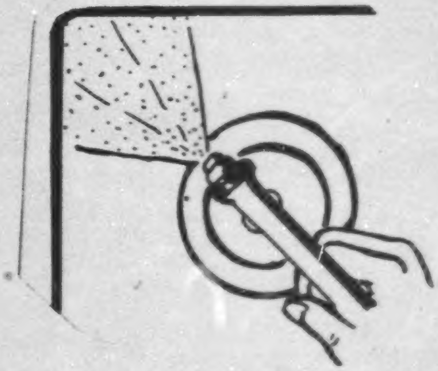
11. By spraying directly into inside corners such as angle iron braces and frames on farm machinery, the effect is to:

A. deposit too thin a coat at the edges and too heavy in the corner
B. obtain a uniform spray pattern
C. deposit too thin a coat in the corner and too heavy at the edges
D. none of the above three are correct



12. When spraying horizontal panels with edges to be banded:

A. the wider horizontal surface should be sprayed first before the banding of the edges
B. the edges should be banded before painting the larger horizontal surface
C. the pattern should be continuous around the corners to get surface and edge in one stroke
D. there is no one procedure better than another

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13. Small cylinder shapes such as pipes or tubing used for frames on implements are best sprayed with:

A. small round pattern
B. three or four lapping strokes moving the legth of the pipe
C. a speeded up movement of the gun
D. all of the above

14. A good way to be sure paint used for spraying is thoroughly mixed is to:

A. pour off the thin material into another container, stir the pigment throughly and then slowly remix the material poured off
B. pour out one half of contents into a second container, mix each one thoroughly, then pour them back together
C. run the air pressure of the compressor into the bottom of the paint container so the air loosens pigment from the bottom until air bubbles are well distributed

15. Adding thinner to paint will:

A. increase costs as thinner is lost by evaporation
B. increases the amount of overspray
C. reduces thickness of paint film
D. accomplish all items in A,B, and C

16. When determining the proper viscosity (resistance to flow) of a paint and the pressure to use in the spray gun a good rule of thumb would be to use:

A. the heaviest sprayable viscosity and lowest sprayable air pressure
B. the thinnest viscosity that covers well and lowest sprayable air pressure
C. the thinnest viscosity that covers well and a high level of air pressure
D. the heaviest sprayable viscosity and the lowest sprayable air pressure

17. In regards to straining paint before painting, which of the following is the most appropriate statement?

A. material from cans which have not been opened previously do not need to be strained if they have been thoroughly mixed
B. strain all paint through something such as a tea strainer, cheese cloth or nylon stocking
C. strain all material which after mixing still contains lumps and add extra thinner to be sure to keep material from clogging hard to reach parts of the gun

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18. The distance from the spray gun cap to the work being sprayed should be:

A. kept under 6" constantly through each stroke
B. between 6" - 8" and kept constant through each stroke
C. kept over 8" constantly through each stroke
D. varied by viscosity of the paint
E. varied as gun is swung in an arc on each stroke

20. When making repetitive strokes with a spray gun, an even coverage is achieved by:

A. just meeting the edge of the previous stroke pattern with the edge of the new stroke pattern
B. overlapping about 1/4th of the previous stroke pattern by the new stroke pattern
C. overlapping about 1/2 of the previous stroke pattern with the new stroke pattern
D. overlapping about 3/4 of the previous stroke pattern with the new stroke pattern

END OF TEST

TABLE: 3-7
AREA: 3-7
TEST NO.: ______
KUDER-RICHARDSON 20: ______
KUDER-RICHARDSON 21: ______

Item	Correct Option	Relative Diffi- culty	Phi Coeff- icient	Point Biserial Coefficient	Discrim- ination Index
1.	D				
2.	A				
3.	D				
4.	C				
5.	A				
6.	D				
7.	B				
8.	B				
9.	C				
10.	A				
11.	A				
12.	C				
13.	A				
14.	B				
15.	D				
16.	A				
17.	D				
18.	C				
19.	C				
20.	A				
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: The Cooling System

Student Performance Objectives

The student should be able to:

1. When provided with an engine with defects in the cooling system, diagnose the nature of the defects by following appropriate troubleshooting procedures.

2. When provided with a water cooled engine, clean the cooling system or check the antifreeze solution and add water and antifreeze to the radiator.

3. When provided with a water cooled engine with defects in the cooling system, remove, disassemble when necessary and/or inspect the following parts of the cooling system:

   A. Fan Belt and Fan
   B. Radiator Hoses
   C. Thermostat
   D. Radiator
   E. Water Pump
   F. Water Filter

4. When provided with an engine in which defects in the cooling system have been identified, replace, reassemble when necessary install, and/or adjust the following parts of the cooling system:

   A. Fan Belt and Fan

   B. Radiator Hoses

   C. Thermostat

Unit: The Cooling System
(3-9)

1. If an engine which is designed to operate at 180°F is operated instead at 140°F, the result would likely be:

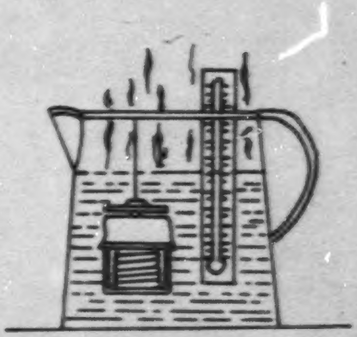
   A. lower horsepower
   B. increased fuel consumption
   C. increase in rate of wear of engine parts
   D. A and B from above
   E. A, B and C from above

2. If a test showed carbon monoxide in the water in the radiator of a tractor after the engine had been running for more than ten minutes, what would be the most probable cause?

   A. damaged head gasket
   B. exhaust manifold gasket leaking
   C. worn or broken valves
   D. worn out water pump

3. When using the procedure shown in this picture, which of the following is the mechanic testing about the cooling system?

   A. thermostat
   B. pressure cap
   C. anti-boiling condition
   D. cooling system efficiency



GO TO NEXT PAGE

4. Pressurized radiator caps are used:

A. to keep the water in the radiator
B. to increase the water volume
C. to increase the boiling temperature of the water
D. to keep foreign material from getting inside

5. A pressure cap for the radiator serves the function of:

A. raising the boiling point of the coolant
B. lowering the boiling point of the coolant
C. prevents a vacuum in the system as it cools
D. helps maintain a vacuum in the system as it cools
E. both A and C above

6. During warm-up of an engine the thermostat:

A. should remain closed to quickly warm the engine
B. should open so water can flow to quickly warm the engine
C. should close as the water temperature rises
D. serves no function until the water reaches the recommended operating temperature

7. The engine manufacturer's recommendation should be followed for each engine but generally the radiator should be filled with coolant:

A. to ½" to 2" below the neck of the radiator to allow for expansion
B. to the neck of the radiator to reduce oxidation and rusting
C. to the level of the over flow tube to maintain adequate pressure
D. when the engine is warm rather than cool

8. When filling the radiator, allow space at the top of the radiator because:

A. all coolants expand when cooled
B. all collants expand when heated
C. all coolants boil at 180°F
D. not all radiators have an over flow pipe

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9. Using the following chart, how many quarts of antifreeze are required for a tractor with a cooling system capacity of 18 quarts if the desired protection temperature is -10°?

A. 5 quarts
B. 6 quarts
C. 7 quarts
D. 8 quarts

FREEZING PROTECTION TABLE

Cooling system Capacity in Quarts	"Permanent" Antifreeze Required 1	2	3	4	5	6	7	8	9
5	16°	-12°	-63°						
6	19°	0°	-34°						
7	22°	7°	-17°	-54°					
8	23°	11°	-7°	-34°	-69°				
9	24°	14°	0°	-21°	-50°				
10	25°	16°	4°	-12°	-34°	-62°			
11	26°	18°	8°	-6°	-23°	-47°			
12		19°	10°	0°	-15°	-34°	-57°		
13		21°	13°	3°	-9°	-25°	-45°	-66°	
14			15°	6°	-5°	-18°	-34°	-54°	
15			16°	8°	0°	-12°	-26°	-43°	-62°
16			17°	10°	2°	-8°	-19°	-34°	-52°
17			18°	12°	5°	-4°	-14°	-27°	-42°
18			19°	14°	7°	0°	-10°	-21°	-34°
19			20°	15°	9°	2°	-7°	-16°	-28°
20				16°	10°	4°	-3°	-12°	-22°
21				17°	12°	6°	0°	-9°	-17°
22				18°	13°	8°	2°	-6°	-14°

10. Using this same chart, how many quarts of antifreeze are required for a tractor with a cooling system capacity of 21 quarts if the desired protection temperature is 10°?

A. 4 quarts
B. 6 quarts
C. 7 quarts
D. 8 quarts

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11. Which of the following would not cause a tractor engine to overheat?

A. overflow tube broken off
B. loose fan belt
C. insufficient oil
D. overloading of the engine

12. The main reason for keeping air cooled engines as clean as possible from accumulations of dirt and other matter is:

A. to assist in the dissipation of engine heat
B. to reduce friction
C. to reduce the chance of getting dirt in the gasoline tank
D. to keep from overloading the engine

13. If rust and scale are noticed in the coolant when draining an engine cooling system, the system should be cleaned with a cleaner, having:

A. an acid-base
B. an alkali-base
C. detergent emulsifiers
D. corrosion inhibitors

14. If an anti-freeze is not used in the cooling system of an engine during warm weather, the best coolant would be:

A. hard water (well water) without a rust inhibitor
B. softened or distilled water without a rust inhibitor
C. hard water (well water) with a rust inhibitor
D. soft water or distilled water with a rust inhibitor

15. A properly working cooling system thermostat should:

A. be fully closed at the temperature stamped on it
B. begin to open within + or -10°F of the temperature stamped on it
C. be fully open at the temperature stamped on it
D. be fully open at 22°F above the specified temperature
E. open as stated in both B and D

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16. The hydrometer is used to:

    A. test items mentioned in both B and C below
    B. check the freezing protection of coolant
    C. check the condition of a battery charge
    D. test the pressure on a cooling system
    E. test the temperature range of a thermostat

17. Antifreeze solution leaking into the crankcase oil will have the effect of:

    A. causing the oil to turn a deep black
    B. a milky appearance of the oil
    C. build up crankcase pressures
    D. bubbles in the coolant

18. The major purpose of a water jacket around the engine cylinders is to:

    A. carry heat to lubrication system so it flows more freely and prevents wear
    B. keep enough heat around engine for efficient operation
    C. remove excess heat from engine to prevent damage to moving parts
    D. warm the coolant in the radiator for auxillary heating and efficient operation

19. Leaving ethylene-glycol base antifreeze solutions in the cooling system through hot summer weather can have the affect of:

    A. preventing 'water pump squeal', lowering the boiling point of the coolant
    B. maintaining adequate rust and corrosion inhibitors
    C. raise the boiling point of the coolant
    D. removing more heat from engine
    E. accomplishing all affects of the items A, B, C and D

20. Rust in the cooling system is increased by:

    A. oxygen in the coolant reacting with metal parts
    B. minerals in hard water
    C. the use of soft water and ethylene-glycol antifreeze
    D. both A and B above

END OF TEST

TABLE: 3-9 A
AREA: Agricultural Equipment and Mechanics
TEST NO.: 3-9
KUDER-RICHARDSON 20: .773
KUDER-RICHARDSON 21: .684

N(tests) = 18

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	E	.500	.990	.491	80.0
2.	A	.222	.918	.529	60.0
3.	A	.056	.625	.534	20.0
4.	C	.222	.800	.415	40.0
5.	E	.500	.918	.396	60.0
6.	A	.222	.918	.719	60.0
7.	A	.111	.625	.375	20.0
8.	B	.167	.625	.389	20.0
9.	C	.111	.800	.677	40.0
10.	B	.389	.249	.132	15.0
11.	A	.167	.918	.559	60.0
12.	A	.167	.800	.432	40.0
13.	A	.833	.094	.078	5.0
14.	D	.222	.990	.757	80.0
15.	E	.667	.861	.358	55.0
16.	A	.667	.000	.593	100.0
17.	B	.056	.625	.188	20.0
18.	C	.111	.800	.677	40.0
19.	E	.611	.625	.193	30.0
20.	D	.278	.661	.446	35.0
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: Assembly, Adjustment, Repair and/or Service of Planting Equipment

Student Performance Objectives

The student should be able to:

1. When provided with knocked-down planting equipment inspect the bundles for missing parts and assemble the various types of planting equipment according to directions in the operator's instructional manual.

2. When provided with various types of assembled planting equipment, make initial adjustments on the equipment and provide pre-delivery service according to the directions in the operator's instructional manual.

3. When provided with various types of assembled planting equipment, load, deliver and unload assembled planting equipment at the proper customer location with no damage resulting to the assembled equipment.

4. When provided with various types of malfunctioning planting equipment in need of minor repairs or service, make such minor repairs and service according to directions detailed in the operator's instructional manual.

AREA: AGRICULTURAL EQUIPMENT AND MECHANICS

Unit: Assembly, Adjustment, Repair and Service of Planting Equipment

(3-11)

1. When hauling equipment on a trailor, it should be loaded so that the center of the load is:

A. right over the axle
B. behind the axle
C. just slightly ahead of the axle
D. in any of the positions described in A, B or C

2. The runners of row crop planters should be adjusted so they are:

A. slightly toed in at the front
B. slightly toed out at the front
C. all angled slightly to the left
D. set perfectly straight - 90° to the planter frame

3. When preparing to set-up a piece of new equipment one of the first steps is to:

A. arrange bundles neatly and in a logical order in your set-up area
B. remove the materials from each bundle and place together next to where machine is to be set up
C. remove all tags from the bundles and turn them in to the manager for safe keeping
D. scrape all paint from shafts on which gears or pulleys are to be placed

4. After the machine is assembled, make final adjustments as outlined in the set-up manual.

A. true
B. false

GO TO NEXT PAGE

5. If gears or pulleys do not slide easily over the shaft on which they are to be placed, you should:

A. see that all paint is scraped from the shaft
B. drive the pulley or gear on with a hammer
C. use a rat tail file and enlarge the hole in pulley or gear
D. grind down the shaft with an emery wheel

6. Before leaving the dealership, the delivery man should:

A. review the operating principles of the machine to be delivered
B. determine if payment is to be received before the equipment is left with the customer
C. obtain a written list of all items of used equipment he should return to the dealership
D. all of the above

7. If the instructions for setting up a piece of equipment are not clear, the best procedure is to:

A. always ask someone else what to do immediately
B. never ask for help because this shows you do not know your job
C. call the machinery company immediately and inform them of the poor instructions so they will get it corrected in the manuals
D. try to solve the problems you encounter by yourself. If help is needed but not readily available, assemble other parts until you can obtain help

8. After cutting bundle wires it is a good idea to keep all tags with the contents of each bundle until machinery set-up is complete.

A. true
B. false

9. It is the delivery man's job to get the new machine delivered safely, but it should be solely up to the new owner to use his manual to learn to operate, adjust and maintain the new machine.

A. true
B. false

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10. In set-up instructions, right and left hand references are determined by standing at the rear of the equipment and face in the direction of travel.

    A. true
    B. false

11. If a farmer plans to increase his corn planting speed from 3 miles per hour, the cell size in the seed plates should be:

    A. the same at both speeds
    B. decreased for the higher speeds
    C. increased for the higher speeds

12. When a piece of equipment is delivered the customer should be asked to sign a Delivery Report.

    A. true
    B. false

13. One of the most efficient ways to assemble equipment is to:

    A. tighten bolts completely as you go
    B. wait until machine set-up is completed to test correct assembly
    C. leave all bolts loose in an assembly until all bolts are in place and you know assembly is correct, then tighten bolts
    D. have one person read the instructions out loud while another does the assembly

14. An expected cause of seed cracking in a corn planter is:

    A. planter shoe too deep
    B. cut off or knocker not working properly
    C. heel of runner running too low
    D. all of the above

GO TO NEXT PAGE

15. Fertilizer shear pin breakage may most likely be caused by:

A. traveling long distances with hoppers full
B. incorrect seed plates
C. heel of runner, running low
D. knocker not working

16. One of the best ways to get tight fitting gears and pulleys onto a shaft is to hit them with a hammer.

A. true
B. false

17. The tractor rolling backwards when the runner of a corn planter is in the ground would most likely cause the:

A. cut off to malfunction
B. hill drop to become out of time
C. runner to plug
D. knocker to malfunction

18. If any part is accidently broken during set-up, inform your supervisor or employer.

A. true
B. false

19. The parts of the corn hopper and drop mechanism will function more smoothly if they are provided with regular addition of:

A. lubricating oil
B. lubricating grease
C. graphite
D. motor oil additive

GO TO NEXT PAGE

20. Gear boxes and lubrication points should not be lubricated in the shop but this should wait until machine is delivered so that proper lubrication can be demonstrated to the buyer.

A. true
B. false

21. Oil on gears and chains may actually be harmful to these parts if the machinery is used in:

A. sandy conditions
B. very hot climates
C. muck or high clay soils
D. very cold weather

22. Causes of inaccurate drop of corn kernels would include:

A. incorrect seed plate
B. planting too fast
C. sprocket or gear slipping
D. all of the above

23. As corn planter speeds are increased difficulty may be expected because!

A. heavy rates of fertilizer will be applied
B. too many kernels may be a problem
C. cracking of kernels may be a problem
D. seed will be covered too deeply

24. Erratic seed spacing by a corn planter may be caused by:

A. slipping chain
B. improper planter spacing
C. disk openers adjusted too close
D. slipping ground wheel

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25. Which of the following drill furrow openers is best for trashy conditions?

A. shoe-type
B. hoe-type
C. single disk
D. lister

26. If you want 21,000 plants of corn per acre and you have seed with 85% germination, how many seeds must you plant per acre?

A. 21,000 seeds
B. 24,150 seeds
C. 24,700 seeds
D. 28,225 seeds

27. What is the recommended method of changing a corn planter in the field to increase the rate of seeding?

A. decrease the speed of the seed plate
B. use a seed plate with more seed cells
C. select a seed plate with larger seed cells
D. increase the speed of the seed plate

28. You have a flex planter set up for planting corn with a cell plate having 28 holes. This planter has a 16" diameter press wheel with a 3 to 1 ration to the cell plate. The tractor will be traveling at the rate of 3 miles per hour. What will be the spacing of the kernels of corn of the rows?

A. 5"
B. 6"
C. 7"
D. 10"

29. One method of classifying grain drills is according to type of seed metering mechanism used. Which of the following classifies grain drills correctly on the above basis?

A. hoe and disk
B. speed and volume
C. star wheel and double disk
D. double-run and fluted-force-feed

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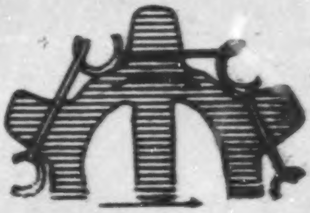
30. When hauling equipment on a trailor, the center of the weight of the equipment should be placed:

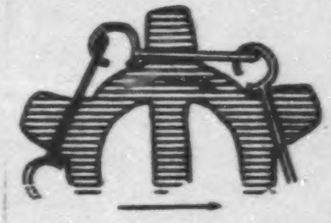
A. right over the axle
B. behind the axle
C. just slightly ahead of the axle
D. in any of the above positions

31. The correct way to place an open-link drive chain over a sprocket gear is shown in:

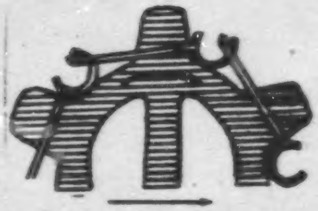
A.



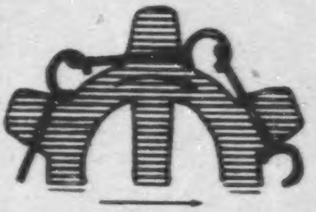
B.



C.



D.



END OF TEST

TABLE: 3-11
AREA: 3-11
TEST NO.:
KUDER-RICHARDSON 20:
KUDER-RICHARDSON 21:

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	C				
2.	D				
3.	A				
4.	A				
5.	A				
6.	D				
7.	D				
8.	A				
9.	B				
10.	A				
11.	C				
12.	A				
13.	C				
14.	B				
15.	A				
16.	B				
17.	C				
18.	A				
19.	C				
20.	B				
21.	A				
22.	D				
23.	C				
24.	D				
25.	C				
26.	C				
27.	D				
28.	B				
29.	D				
30.	C				

TABLE: 3-11
AREA: 3-11
TEST NO.: ____________

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
31.	A				
32.					
33.					
34.					
35.					
36.					
37.					
38.					
39.					
40.					
41.					
42.					
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44.					
45.					
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48.					
49.					
50.					

AREA: AGRICULTURAL PRODUCTS (FOOD PROCESSING)

Unit: Storing Food Products

Student Performance Objectives

The student should be able to:

1. Using a fork lift truck, stack and/or store food products according to plant specifications and care for the stacking and storing equipment.

2. Placed in a food processing plant warehouse or storage area, regulate storage environment so that food product quality is maintained.

3. Placed in a food processing plant warehouse or storage area with specific types of food products, take inventory of the products to assist in increasing processing and/or shipping efficiency.

AREA: AGRICULTURAL PRODUCTS (FOOD PROCESSING)

Unit: Storing Food Products
(4-1)

1. Maintaining the proper temperature and relative humidity in raw agricultural product storage:

A. retards spoilage and quality changes
B. will improve the quality of raw agricultural products
C. will prevent product spoilage indefinitely
D. all three of the above are correct

2. Moth infestations in stored grains and peanuts can readily be identified by:

A. a noticeable webbing left on the surface by the crawling larvae
B. mud tunnels built on the side of storage bins
C. a purple discoloration of the stored food
D. a black mold growing in clumps under the surface

3 The best time for providing maintenance on stacking and storing equipment is:

A. during off-hours
B. one hour after equipment begins operating each day
C. about mid-way through the working day
D. one hour before ending work each day

4. Raw agricultural products should be thoroughly inspected before storing:

A. to keep storage infestation and product spoilage at a minimum
B. to protect the quality of foods in which the raw agricultural products are used
C. both A and B

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5. The most effective and economical way of maintaining the quality of grain, oil seeds, peanuts, and their processed products is to:

A. take the necessary measures to prevent insect, mold bacteria, and rodent damage
B. treat the materials with insecticide at the first signs of an infection
C. use a systemic insecticide on the crops while in the field
D. fumigate the materials before they are stored

6. Maintenance of stacking and storing equipment is important because:

A. it is directly related to the amount of labor consumed
B. there is an income tax advantage to well kept equipment
C. federal regulations require equipment be maintained on a regular schedule
D. labor unions require submittance of maintenance schedules

7. Knowledge and application of good storage practices:

A. permits inspection and inventory of raw ingredients
B. allows more efficient product rotation
C. makes it easier to keep the storage area clean and free of insects
D. all of the above

8. Most grain insects become inactive and mold growth diminishes:

A. if relative humidity is kept at 70% or above
B. at temperatures below 45°F
C. at temperatures of 90° or above
D. double walls and floors are used for storage facilities

9. The best choice of conveyors to use for moving unusually shaped items would be:

A. curved roller conveyor
B. wheel conveyor
C. belt conveyor
D. live roll conveyor

GO TO NEXT PAGE

10. Raw agricultural products:

    A. can all be safely stored below 40° F regardless of the relative humidity
    B. can all be safely stored below 40° F if the relative humidity is controlled
    C. differ somewhat in the temperature and/or relative humidity at which they should be stored
    D. can all be safely stored at 70° relative humidity regardless of the temperature

11. Deterioration of stored fats, oils, oilseeds, and the fatty constituents in dehydrated products is usually increased by:

    A. an absence of oxygen in the storage area
    B. fumigating the crops the products came from
    C. an excess of oxygen in the storage area

12. If a straddle-type fork truck is used to move materials the pallet style best adapted to this truck is the:

    A. four-way, flush end
    B. four-way, single wing
    C. two-way, flush end
    D. two-way, double-wing

13. Relative humidity refers to:

    A. the amount of oxygen in the air
    B. the amount of moisture in the air
    C. the rate of air movement in the storage area
    D. the ratio of carbon dioxide to oxygen in the air

14. Insects cannot survive in atmospheres that have less than 2% oxygen.

    A. true
    B. false

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15. Improper storage temperatures:

A. will affect the flavor quality of raw agricultural products but not the nutritional value or wholesomeness
B. will affect the flavor and nutritional value of raw agricultural products but not the wholesomeness
C. will affect the wholesomeness and flavor but not the nutritional value of raw products
D. may affect the flavor, nutritional value and wholesomeness of raw agricultural products

16. Regulating the oxygen level to 13-15% oxygen in grain storage:

A. can be used to kill insects
B. may retard mold growth but not effect insects
C. will cause an increase in insect activity
D. has no effect on controlling pests of grain storage

17. If moisture content, oxidation, and browning reactions are controlled by appropriate formulation and packaging, dehydrated foods have a potential storage life of:

A. 1-3 months
B. 3-12 months
C. 1-3 years
D. 5-10 years

18. Cooler shrinkage of carcass is greatest when:

A. humidity and air movement are high
B. humidity and air movement are low
C. humidity is low and air movement is high
D. humidity is high and air movement is low

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19. Freezer burn results in:

A. a loss of water but has no affect on quality
B. both a loss of water and deterioration of meat quality
C. a deterioration of quality but no loss of water
D. none of the above

20. Products such as summer sausage and pepperoni can be maintained at highest quality during storage by:

A. keeping the relative humidity high
B. keeping the relative humidity low
C. a wide range or relative humidity
D. keeping both relative and humidity high

21. In order to keep dehydration of fresh meat low, the ideal temperature range is:

A. 28° - 36° F
B. 36° - 42° F
C. 40° - 46° F
D. 30° - 40° C

22. One of the major economic problems of the meat industry is:

A. maintaining an adequate supply of meat in storage
B. adequate storage facilities for meat products
C. control of moisture in meat tissue during storage
D. a uniform labeling of meat cuts

23. Dehydration of fresh meat in the cooler causes:

A. weight loss and lighter meat color
B. loss of volume but little or no weight loss
C. loss of weight and darkening of color
D. loss of volume and weight with little or no change of color

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24. Torn or broken packages of meat in frozen storage:

A. have no affect on the quality of meat as long as temperature is kept below 10° F
B. result in product quality loss through freezer burn
C. are only a problem because it allows the meat to be contaminated
D. are usually the source of botulism food poisoning

25. For best quality of meat the freezing process should:

A. be quite rapid
B. very slow during first 24 hours, then rapid
C. never take the temperature below 20° F
D. be rapid with pork but much slower with beef

26. In order to keep dehydration of frozen meat low the storage temperature range should be maintained at:

A. -10° - 0° C
B. 0° - 20° C
C. -10° - 0° F
D. 0° - 20° C

27 The percent shrinkage in weight which might be expected from the hot carcass weight during first 24 hours in the cooler is:

A. less than 2% for all meats
B. usually ½ - 3%, but normally more for lean than fat carcasses
C. usually ½ - 3%, but normally more for fat than lean carcasses
D. not affected by the relative humidity in the cooler

28. Carcass and meat product weight loss during cooling is effected primarily by:

A. microbial activity in the meat
B. humidity and air movement in the cooler
C. the degree of fat in meat
D. the age of slaughtered animals

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29. Microbial growth during the storage of meat is approximately ______ times as great at 40° F as it is at 32°.

A. 1.25
B. 1.50
C. 2.0
D. 4.0

30. When cold meat products are exposed to a moist warm environment they:

A. will keep high quality for a long time
B. should be moved fast because condensation forms and chances for microbial growth increases
C. will gain weight through moisture condensation which compensates for that lost in dehydration
D. back A and C are correct

END OF TEST

TABLE: 4-1 S
AREA: Agricultural Products
TEST NO.: 4-1
KUDER-RICHARDSON 20: .686
KUDER-RICHARDSON 21: .480

N(tests) = 30

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	A	.250	.884	.617	50.0
2.	A	.125	.000	.202	00.0
3.	A	.250	.884	.309	50.0
4.	C	.125	.884	.404	50.0
5.	A	.125	.884	.404	50.0
6.	A	.750	.000	.772	100.0
7.	D	.375	.000	.828	100.0
8.	B	.250	.884	.309	50.0
9.	C	.500	.00	.134	00.0
10.	C	.625	.884	.276	50.0
11.	C	.250	.884	.463	50.0
12.	B	.750	.884	.309	50.0
13.	A	.999	.000	.000	00.0
14.	A	.625	.884	.552	50.0
15.	D	.000	.000	.000	00.0
16.	A	.875	-.884	-.404	-50.0
17.	D	.750	.884	.463	50.0
18.	C	.500	.000	.802	100.0
19.	B	.250	.000	.154	00.0
20.	B	.375	.884	.138	50.0
21.	A	.625	.884	.414	50.0
22.	C	.375	.884	.552	50.0
23.	C	.125	.000	-.202	00.0
24.	A	.999	.000	.000	00.0
25.	C	.999	.000	.000	00.0
26.	B	.999	.000	.000	00.0
27.	C	.875	.884	.404	50.0
28.	B	.375	.000	.690	100.0
29.	D	.625	-.000	-.552	-100.0
30.	B	.250	.884	.617	50.0

AREA: AGRICULTURAL PRODUCTS (FOOD PROCESSING)

Unit: Stunning, Shackling and Bleeding

Student Performance Objectives

The student should be able to:

1. Using the school meat laboratory or livestock meat processing plant and given livestock to be stunned, identify and select and apply stunning techniques so that animals are stunned quickly, thoroughly, and with minimum damage to the head.
2. Given livestock to be shackled, shackle livestock to facilitate skinning or scalding processes.
3. With shackled livestock to be bled, bleed animals so that blood is quickly and thoroughly removed from the carcass.
4. Clean and sanitize shackling and bleeding equipment to meet plant sanitation requirements in addition to local, state and federal sanitation standards.

AREA: AGRICULTURAL PRODUCTS

Unit: Stunning, Shackling and Bleeding Livestock (4-2)

1. It is important that bleeding equipment is scrubbed clean before using a sanitizer to insure that the sanitizer is effective.

A. true
B. false

2. Indicate which type of livestock would be stuck and bled by the following description:

> "With the animal shackled and hanging down, steady the shoulder with one hand and insert the knife several inches in front of the breast and point directly toward the tail, give an upward thrust, dip the point until it strikes the backbone and then withdraw it."

A. mature beef
B. sheep
C. veal calf
D. hogs

3. According to The Federal Humane Slaughter Act, electrical shock to the head is a permissible way to stun livestock prior to slaughter.

A. true
B. false

4. The only bad effect that comes from having a sanitizing solution stronger than the recommended solution is that the sanitizer is wasted.

A. true
B. false

5. The correct placement of a chain shackle on swine being prepared for the slaughter is between the:

A. knee and shoulder of the foreleg
B. knee and pastern of the foreleg
C. pastern and hock of the rear leg
D. hock and the ham

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6. According to The Federal Humane Slaughter Act hogs may be gassed with carbon dioxide as a means to immobilize them prior to slaughter.

A. true
B. false

7. When stunning calves or sheep with a concussion instrument, strike the animal just under its ear.

A. true
B. false

8. It is better to steady a hog during the sticking process by placing a hand on the back, than it is to hold on to a leg.

A. true
B. false

9. A once a week clean-up and sanitizing of bleeding equipment is good enough for satisfactory cleanliness:

A. true
B. false

10. It is a good practice to get animals excited and warmed-up prior to slaughter so that they will bleed quickly and thoroughly when stuck.

A. true
B. false

11. Kosher killing of livestock is:

A. done by one of three stunning methods permitted by The Federal Humane Slaughter Act
B. a ritual slaughter method which does not employ stunning and is exempt from The Federal Humane Slaughter Act
C. is a ritual slaughter method that complies with The Federal Humane Slaughter Act and uses a chemical immobilizer
D. not permitted by anyone except Federal Meat Inspector

12. Hogs that have been stunned by electrical probe should be stuck fairly quickly after the stunning.

A. true
B. false

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13. High pressure water hoses are a valueable aid in cleaning shackling equipment prior to sanitizing.

A. true
B. false

14. The same size shackle chain is appropriate for both beef and swine.

A. true
B. false

15. Foreign material such as manure, blood or animal tissue that get into the sanitizing solution will decrease the effectiveness of the sanitizer.

A. true
B. false

16. Speed and timing are important for smooth performance when shackling livestock.

A. true
B. false

END OF TEST

TABLE: 4-2
AREA: 4-2
TEST NO.:
KUDER-RICHARDSON 20:
KUDER-RICHARDSON 21:

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	A				
2.	D				
3.	A				
4.	B				
5.	C				
6.	A				
7.	B				
8.	A				
9.	B				
10.	B				
11.	B				
12.	A				
13.	A				
14.	B				
15.	A				
16.	A				
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

AREA: AGRICULTURAL PRODUCTS (FOOD PROCESSING)

Unit: Identifying and Cutting Wholesale and Reail Beef Cuts

Student Performance Objectives

The student should be able to:

1. Using facilities of a commercial meat cutting department and/or comparable facilities in the school meat laboratory, identify and cut up beef side carcasses into the prescribed wholesale cuts accurately within a time period acceptable for entry level employment in the beef meat industry.

2. Given beef wholesale meat cuts, identify and cut into retail cuts accurately within a time period acceptable for entry level employment in the beef meat industry.

AREA: AGRICULTURAL PRODUCTS (FOOD PROCESSING)

Unit: Identifying and Cutting Wholesale and Retail Beef Cuts (4-3)

NOTE: Use the illustration on the following page to answer questions 1-4.

1. From the illustration on the following page, Part E is the:

   A. square cut chuck
   B. short plate
   C. flank
   D. round

2. Part C from the same illustration is the:

   A. sirloin
   B. shank
   C. brisket
   D. flank

3. The fore quarter consists of parts:

   A. B,C, and D
   B. B,C,D,H, and I
   C. A,E,F, and G
   D. C,D, and I

4. The separation of Part H from Part I is made:

   A. between the fifth and sixth ribs from the neck
   B. between the eighth and ninth ribs from the neck
   C. only when cutting for the eastern markets
   D. when cutting choice and prime carcasses but not good or standard

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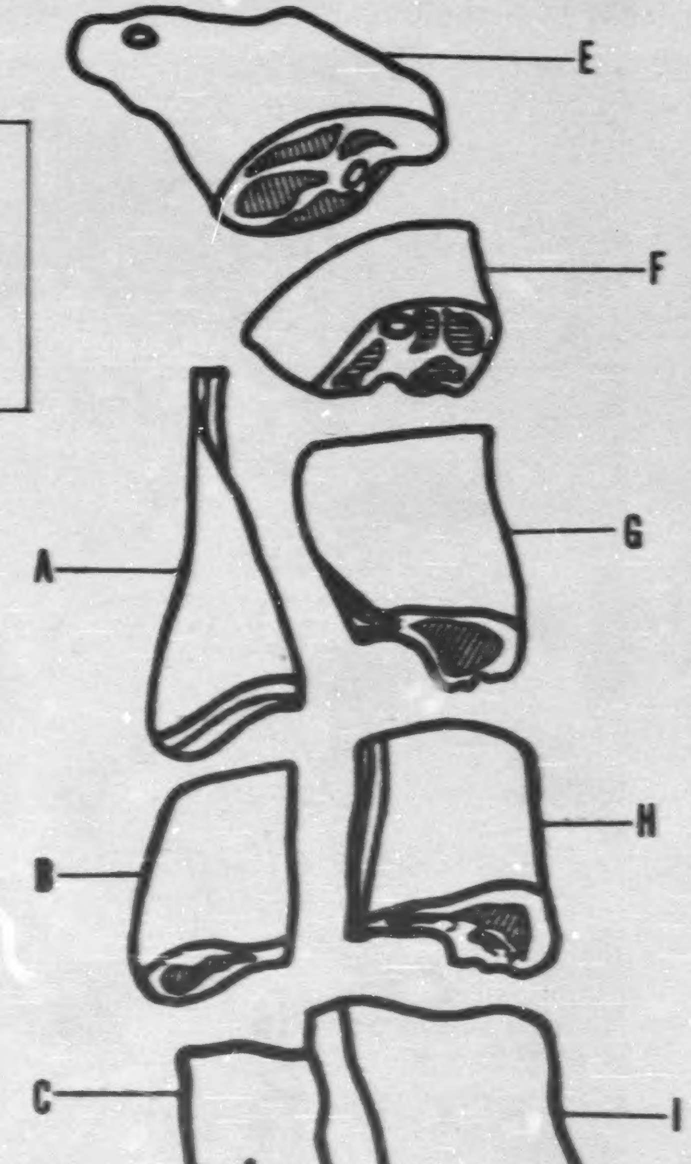
BEEF
WHOLESALE
CUTS



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NOTE: Use the illustration on the following page to answer questions 5-8.

5. From the illustration on the following page, Part (1d) is:

A. heel of round
B. sirloin tip
C. bottom round
D. tip of round

6. Part [illegible] from the same illustration is:

A. club steak
B. short rib
C. rib steak
D. t-bone

7. Most steers produce about ____ pin bone sirloin steak(s) on each side:

A. one
B. two
C. four
D. six

8. The several steaks cut from the rib end of the short loin are called:

A. t-bone steaks
B. porterhouse steaks
C. club steaks
D. strip steaks

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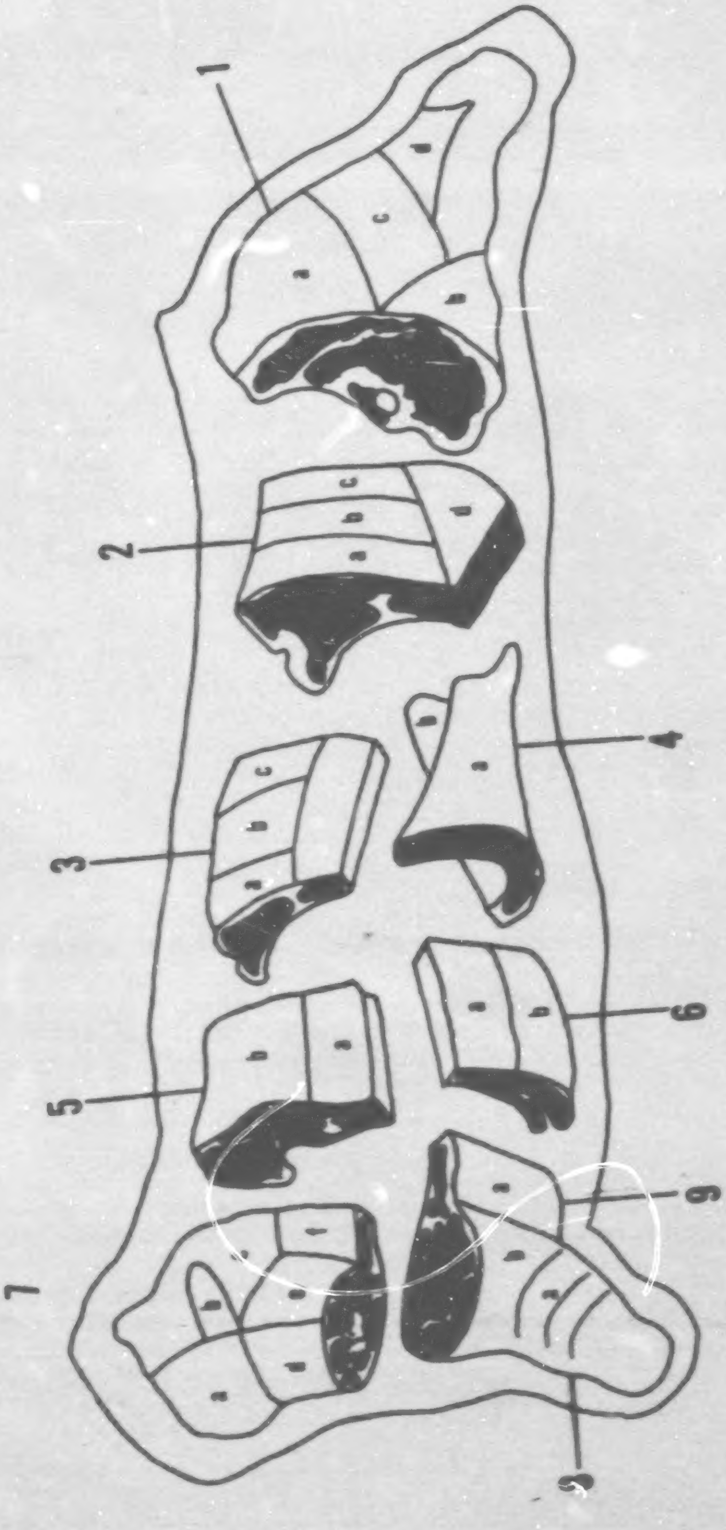

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9. The carcass of a 1,000 lb. beef animal should weigh about _____% of the live animal weight.

   A. 50
   B. 60
   C. 70
   D. 75

10. Separating beef sides into fore quarters and hind quarters is a practice called:

   A. ribbing or quartering
   B. fisting
   C. boxing beef
   D. New York quartering

11. Especially important in trimming the bottom round subprimal is:

   A. not to include the heel if used New York style
   B. to remove the cap muscles
   C. to trim the fat to 0.1 of an inch
   D. to remove and exclude the popliteal lymph gland and surrounding fat

12. Another name for the diaphragm muscle is the:

   A. hanging tenderloin
   B. pin wheel steak
   C. chine
   D. cap muscle

13. Of the following fabrication processes, which would commonly be the first one done?

   A. removal of the kidney, pelvic, and heart fat
   B. removal of the primal round
   C. removal of the hanging tenderloin
   D. removal of the wholesale flank

14. A method for removing the primal round from the hind quarter which avoids ruining the tip roast by not including any of the tip with the round is called the:

   A. Chicago round
   B. New York round
   C. top round
   D. diamond round

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15. The first step in muscle boning the round is the removal of the:

    A. hind shank bone (tibia)
    B. femur
    C. pattela
    D. knucklebone

16. Beginning to saw from the sirloin or caudal end the first steaks off the shortloin and those having the largest area of tenderloin muscle are the:

    A. t-bone steaks
    B. top-loin steaks
    C. club steak
    D. porterhouse steak

17. Each half of a split beef carcass from an animal which weighed 1,000 lbs live, would be expected to weigh approximately:

    A. 200 lbs
    B. 250 lbs
    C. 300 lbs
    D. 600 lbs

18. The separation of the sirloin from the shortloin is achieved by making a cut

    A. between the fifth and sixth lumbar vertebrae
    B. between the femur and the tibia
    C. at the scapula
    D. 10 inches from the chine

19. Bottom round steaks from lower grading cattle may be passed through a mechanical tenderizer and merchandised quite desirably as:

    A. cubed (minute steaks)
    B. pin wheel steaks
    C. boneless strip steak
    D. hanging tenderloin

20. Another name for the club steak is:

    A. top-loin steak
    B. t-bone steak
    C. porterhouse
    D. boneless strip steak

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21. A beef part that is composed almost entirely of elastic connective tissue and is essential that it be removed because it cannot be made palatable by cooking is the:

A. eye of round
B. diaphragm skirt
C. neck leader
D. heel of round

END OF TEST

TABLE: 4-3 S
AREA: Agricultural Products
TEST NO.: 4-3
KUDER-RICHARDSON 20: .754
KUDER-RICHARDSON 21: .676
N(tests) = 22

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D	.000	.000	.000	00.0
2.	C	.227	.353	.272	19.0
3.	B	.273	.965	.524	66.7
4.	A	.045	.413	.336	16.7
5.	A	.227	.891	.479	50.0
6.	D	.227	.965	.746	66.7
7.	B	.500	-.951	-.521	-69.0
8.	C	.455	.951	.508	69.0
9.	B	.091	.780	.400	33.3
10.	A	.455	.696	.258	38.1
11.	D	.999	.000	.000	00.0
12.	A	.409	.853	.447	52.4
13.	C	.500	.853	.298	52.4
14.	B	.455	.951	.532	69.0
15.	A	.682	.729	.414	40.5
16.	D	.136	.891	.648 .625	50.0
17.	C	.318	.965	.625	66.7
18.	A	.364	.998	.725	83.3
19.	A	.364	.998	.673	83.3
20.	A	.273	.707	.441	35.7
21.	C	.364	.951	.596	69.0
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

TABLE: 4-3 A
AREA: Agricultural Products (Food Processing)
TEST NO.: 4-3
KUDER-RICHARDSON 20: .751
KUDER-RICHARDSON 21: .732
N(tests) = 72

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	D	.361	.998	.614	82.4
2.	C	.486	.988	.725	77.8
3.	B	.542	.924	.592	64.2
4.	A	.528	.818	.417	50.5
5.	A	.500	.972	.601	73.3
6.	D	.694	.869	.483	56.4
7.	D	.764	.294	.165	15.5
8.	C	.667	.740	.411	41.4
9.	B	.431	.844	.485	51.1
10.	A	.403	.924	.507	61.5
11.	D	.708	.368	.094	20.1
12.	A	.667	.696	.282	36.9
13.	C	.681	.637	.312	32.4
14.	B	.625	.353	.174	21.9
15.	A	.681	.625	.175	29.1
16.	D	.597	.930	.547	65.5
17.	C	.444	.844	.441	51.1
18.	A	.694	.637	.249	32.4
19.	A	.444	.988	.598	77.8
20.	A	.750	.141	.047	8.3
21.	C	.556	.924	.538	64.2
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

AREA: AGRICULTURAL PRODUCTS (FOOD PROCESSING)

Unit: Cleaning and Sanitizing Milk Tankers

Student Performance Objectives

The student should be able to:

1. Using the clean-in-place system, clean and sanitize milk tankers so that when raw milk is pumped into tankers and transported, the keeping quality is maintained.

AREA: AGRICULTURAL PRODUCTS

Unit: Cleaning and Sanitizing Milk Tankers (4-5)

1. The bulk tank and accessories of the milk truck should be washed:

   A. daily
   B. every other day
   C. weekly
   D. only prior to a milk sanatation inspection

2. The cleaning and sanitizing system should follow the schedule:

   A. wash - sanitize - rinse - rinse
   B. wash - rinse - sanitize - rinse
   C. sanitize - rinse - wash - rinse
   D. rinse - wash - rinse - sanitize

3. The temperature of the water to be used in the first rinse of bulk milk tanks:

   A. can be any temperature without affecting the cleaning operation
   B. should be cold or slightly warmed (100° F)
   C. should be 120°F - 140°F
   D. should be over 140°F

4. The stainless steel and glass contact surfaces of bulk tanks are clean when:

   A. rinse water slips (sheets in a continuous layer from top to bottom of the surface and moisture droplets do not appear)
   B. no "squeaky" noise results when dry finger tips are pressed against the surface
   C. there is a milk stain or blue coloration
   D. the water beads up on the surface and tends to stay in large droplets

5. The milk hauler can assume that an automatic washing system for bulk tanks is foolproof.

   A. true
   B. false

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6. Even though procedures may vary according to the chemical bacteriocide, the sanitation procedure for bulk milk tanks usually involves at least one minute exposure to an approved chemical bacteriocide solution of an approved strength (10-100 ppm) at a temperature of 75°F.

   A. true
   B. false

END OF TEST

TABLE: 4-5
AREA: 4-5
TEST NO.: ____________
KUDER-RICHARDSON 20: ____________
KUDER-RICHARDSON 21: ____________

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	A				
2.	D				
3.	B				
4.	A				
5.	B				
6.	A				
7					
8.					
9.					
10.					
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30.					

AREA: AGRICULTURAL PRODUCTS (FOOD PROCESSING)

Unit: Grading Live Poultry

Student Performance Objectives

The student should be able to:

1. Using various species of live poultry, rank the birds according to body quality and use, consistent with U.S. Department of Agriculture (USDA) grading standards.

AREA: AGRICULTURAL PRODUCTS (FOOD PROCESSING)

Unit: Grading Live Poultry
(4-10)

For questions 1 thru 25 use the key shown below for selecting your answer. You are to grade the live market birds on the basis of each statement. All other factors should be considered normal.

A - Grade A
B - Grade B
C - Grade C
D - No Grade

1. Alert, bright eyes, and in good health

2. Large number of pin feathers over all parts of body.

3. Well feathered, thoroughly covering all parts of body.

4. Large flesh bruises.

5. Noticeable fat in the feather tracts of the breast.

6. Poorly fleshed, but not emaciated.

7. Serious skin bruises and moderate flesh bruises.

8. Evidence of disease.

9. Well-developed covering of fat.

10. Slight scratches and skin bruises.

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11. Moderate abnormalities in conformation such as dented, curved or crooked breast.

12. Is of normal physical conformation.

13. Has definte, but not pronounced deformities (crooked breastbone or hunch back)

14. Shape of bird approaches that of a rectangle.

15. Heavy callouses over breast bone.

16. Moderately broad and long breast, with fleshing carrying up to crest of breastbone.

17. Feathers around vent clear and dry.

18. Lacking in vigor.

19. Severe discolorations of skin.

20. Fairly well feathered with moderate number of pin feathers.

21. Has sufficient flesh on the breast on the legs so as to prevent a thin appearance and definite breast bone crestline.

22. Evidence of coccidiosis.

23. No feathers on back.

24. Small amount of fat in the feather tracts and completely lacking in fat on back and thighs.

25. Slightly scaly shanks.

END OF TEST

TABLE: 4-10

AREA: 4-10

TEST NO.:

KUDER-RICHARDSON 20:

KUDER-RICHARDSON 21:

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	A				
2.	C				
3.	A				
4.	D				
5.	B				
6.	C				
7.	C				
8.	D				
9.	A				
10.	A				
11.	B				
12.	A				
13.	C				
14.	A				
15.	C				
16.	A				
17.	A				
18.	C				
19.	D				
20.	B				
21.	B				
22.	D				
23.	C				
24.	C				
25.	A				
26.					
27.					
28.					
29.					
30.					

AREA: AGRICULTURAL PRODUCTS (FOOD PROCESSING)

Unit: Grading Dressed Poultry

Student Performance Objectives

The student should be able to:

1. Given various types of poultry carcasses, identify market classes of birds in regard to species, age and sex, so this information will assist him in ranking the carcasses according to body quality and condition.

2. Given various types of poultry carcasses, identify the characteristics which would lower their carcass grades.

3. Considering U.S. Department of Agriculture (USDA) and state grades of various types of poultry carcasses, rank birds according to their body quality and condition.

AREA: AGRICULTURAL PRODUCTS (FOOD PROCESSING)

Unit: Grading Dressed Poultry
(4-11)

For questions 1 thru 25 use the key shown below for selecting your answer. You are to grade the READY-TO-COOK (dressed) birds on the basis of each statement — ALL OTHER FACTORS SHOULD BE CONSIDERED NORMAL.

A - Grade A
B - Grade B
C - Grade C
D - No Grade

1. One disjointed leg bone.
2. A few scattered nonprotruding pin feathers.
3. A 4-inch tear on back.
4. A 1/2 inch flesh bruise on leg.
5. Wing tips and tail missing.
6. Two nonprotruding broken wing bones.
7. A 3-inch bruise on breast.
8. Two disjointed bones.
9. Breast missing.
10. Poorly fleshed.
11. Second wing joint missing.
12. Sufficient fat on breast and leg to prevent distinct appearance of flesh through skin.
13. One broken and two disjointed bones.
14. A 1-inch tear on back.
15. Well fleshed moderately long and rounded breast.

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16. A 1-inch skin bruise on breast.

17. Four 1/2-inch tears on back.

18. Leg missing.

19. Wings missing.

20. Misshapen legs

21. Breast bone slightly crooked.

22. A 1-inch flesh bruise on breast that renders carcass unfit for food.

23. One broken protruding leg bone.

24. Breast bone seriously crooked.

25. One broken non-protruding wing bone.

END OF TEST

TABLE: 4-11
AREA: 4-11
TEST NO.:
KUDER-RICHARDSON 20:
KUDER-RICHARDSON 21:

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	B				
2.	A				
3.	C				
4.	A				
5.	A				
6.	C				
7.	C				
8.	B				
9.	D				
10.	C				
11.	B				
12.	B				
13.	C				
14.	A				
15.	A				
16.	A				
17.	B				
18.	D				
19.	C				
20.	D				
21.	B				
22.	D				
23.	C				
24.	C				
25.	B				
26.					
27.					
28.					
29.					
30.					

AREA: ORNAMENTAL HORTICULTURE

Unit: Identification and Selection of Trees and Shrubs

Student Performance Objectives

The student should be able to:

1. When given a group of trees and shrubs common to the area, correctly identify each by common name or by scientific name with the aid of reference or an identification key.

2. When given sets of landscaping plans that call for plants by physical size and a tree and shrub list, specify those plants that will fit the space.

3. When given a group of trees and shrubs, select those that best meet the requirements for their intended function.

AREA: ORNAMENTAL HORTICULTURE

Unit: Identification and Selection of Tree and Shrubs
(5-1)

1. In order to achieve contrast, in landscape design one may:

   A. use a low plant near a tall one
   B. use a low plant near a low plant
   C. use a pine next to a spruce
   D. use a tall plant next to another tall plant

2. Which of the following trees has heart shaped leaves?

   A. Red Maple
   B. Redbud
   C. Red Oak
   D. Tuliptree

3 The closest which plants can be spaced so that foliage of two plants does not overlap, requires that the distance from the center of one plant to the other is at least:

   A. 1/2 the mature spread of each plant
   B. 2 times the mature spread of each plant
   C. 1/2 the spread of each young growing plants
   D. 2 times the mature height of the plants

4. Which of the following cannot be used as a ground cover?

   A. Blue Rug Juniper
   B. Vinca
   C. Pachysandra
   D. Winged Euonymus

5. For which group of plants is it generally most important to consider orientation (compass direction) and exposure relative to other landscape features?

   A. broadleaf evergreens
   B. narrowleaf evergreens
   C. deciduous shrubs
   D. fall flowering trees

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6. A general rule to remember when placing shrubs in the landscape is that the spread of the plant is usually:

A. 1/2 of its height of growth
B. 2 times its height of growth
C. equal to its height of growth
D. going to double every year of its growth

7. A proper background for the house:

A. softens the silhouette of the house against the sky
B. makes the house look larger than it really is
C. is necessary for shade
D. should always be composed of evergreen trees

8. When landscaping, unity can be achieved by:

A. using the same screening materials as the neighbors
B. developing asymmetrical balance around a focal point
C. tying plantings together with a living groundcover
D. using a variety of plants throughout the landscape

9 The leaf arrangement of Maple trees is:

A. opposite
B. alternate
C. whorled
D. entire

10. When selecting plants for the landscape plan you should consider:

A. their mature height and spread
B. their foliage, fruit, flowers and habit
C. their soil and exposure requirements and hardiness
D. all of the above

11 A tree which grows in a fastigate shape is the:

A. Flowering Dogwood
B. Redbud
C. Red Maple
D. Upright Ginko

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12. The tallest shrubs in the foundation planting should be placed:

A. at the corners of the house
B. on each side of the front entrance
C. next to the shortest ones
D. between the entrance way and the corners

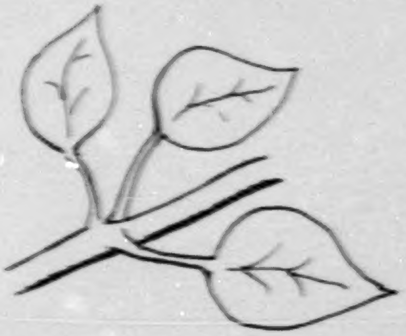
13. The best over-all planting for the public area should be:

A. mostly deciduous plants that are hardy in the area
B. mostly evergreens because they stay green in the winter
C. either all evergreen or all deciduous
D. a combination of broadleaf evergreens, needle evergreens, and deciduous shrubs

14. In the name Gymnocladus dioicus, the word "dioicus" refers to:

A. Specific Epithet (species)
B. Cultivar
C. Genus
D. Family

15. Leaf arrangement as:



is know as:

A. opposite
B. alternate
C. whorled
D. compound opposite

16. When selecting for privacy in the patio area a recommended practice is to:

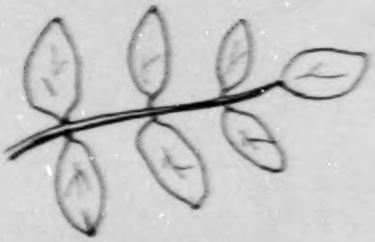
A. construct several screens or baffles close to the patio
B. plant a Rosa Multiflora Hedge along the property line
C. construct a dry wall along the property line
D. plant a dense screen of Cotoneaster Apiculata

17. The leaf margin of the Maple tree are:

A. serrated
B. Lobed
C. entire
D. partial

GO TO NEXT PAGE

18. A leaf composition of:



is known as:

A. pinnately compound
B. palmately compound
C. double pinnately compound
D. whorled

19. The Sentry Maple is best known for its shape which is:

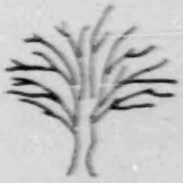
A. globe
B. vase
C. columnar
D. rectangular

20. The leaves of Red Oak are:

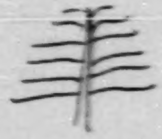
A. entire
B. serrated
C. lobed
D. partial

21. A basic tree shape which is called fastigiate would appear as:

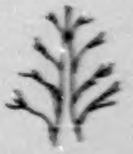
A.



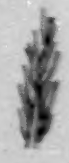
C.



B.



D.



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22. A recommended shade tree that grows over 50 feet tall is:

A. Redbud
B. Red Oak
C. Ruby Red Horsechestnut
D. none of the above

23 A house should be framed with trees:

A. for proper scale and proportion
B. to make it look nice
C. so that one's interest is concentrated on the house
D. in order to have shade

24 Flower beds are undesirable in a public area because they:

A. contrast too sharply with the house
B. compete with the house for attention
C. contrast too sharply with the dull colors of walks and driveways
D. require excessive maintenance and attract insects

25 The point at which leaves arise from the stem is called:

A. an internode
B. a node
C. an axil
D. a limb

26 By arranging groups of plants with low plants in the foreground, medium sized plants behind them, and taller plants in the background, we are using the principle of:

A. scale
B. sequence
C. repetition
D. proportion

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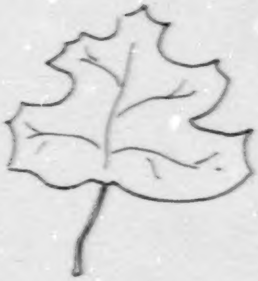
27. The leaf margin of



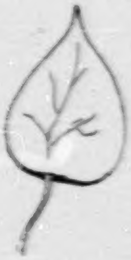
is called:

A. lobed
B. entire
C. toothed
D. serrated

28. The most important feature in a public area is:

A. the birdbath
B. the front entrance
C. the picture window
D. the flower bed or specimen tree

29. The leaf shape of



is known as:

A. obovate
B. oval
C. ovate
D. elliptic

30. A specimen plant is:

A. used to accent a group shrub planting
B. used on either side of the front door
C. intended to be viewed as an individual
D. the plant around which all others must be balanced

END OF TEST

TABLE: 5-1 S
AREA: Ornamental Horticulture
TEST NO.: 5-1
KUDER-RICHARDSON 20: .400
KUDER-RICHARDSON 21: .284
N(tests) = 124

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	A	.177	.685	.353	30.4
2.	B	.750	.110	.036	6.4
3.	A	.685	.673	.294	31.7
4.	D	.621	.729	.397	40.6
5.	A	.944	.000	-.007	00.2
6.	C	.734	.397	.198	23.3
7.	A	.355	.637	.236	32.7
8.	C	.855	.294	.115	14.6
9.	A	.685	.156	.133	9.6
10.	D	.169	.844	.466	44.4
11.	D	.702	.264	.146	14.8
12.	A	.532	.368	.202	23.7
13.	D	.379	.707	.299	38.3
14.	A	.589	.760	.318	43.5
15.	C	.742	.770	.409	40.2
16.	A	.863	.187	.204	9.0
17.	B	.661	-.031	-.015	-1.9
18.	A	.605	.853	.410	51.7
19.	C	.621	.411	.222	26.6
20.	C	.492	.368	.152	24.0
21.	D	.734	-.078	.006	-4.8
22.	D	.694	.264	.153	14.8
23.	C	.823	.125	.106	6.2
24.	B	.726	.836	.436	48.8
25.	B	.460	.625	.338	32.5
26.	B	.718	.110	.091	6.4
27.	A	.790	.187	.086	9.0
28.	B	.274	.718	.321	38.4
29.	C	.597	.891	.437	57.5
30.	C	.508	.729	.333	41.0

TABLE: 5-1 A
AREA: Ornamental Horticulture
TEST NO.: 5-1
KUDER-RICHARDSON 20: .518
KUDER-RICHARDSON 21: .433
N(tests) = 96

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.917	-.172	-.041	-5.4
2.	B	.688	.790	.347	42.8
3.	A	.552	.673	.335	35.7
4.	D	.531	.941	.560	67.0
5.	A	.854	.000	.004	00.3
6.	C	.771	.324	.157	18.2
7.	A	.531	.790	.396	46.8
8.	C	.875	.000	.077	00.3
9.	A	.667	.426	.245	26.9
10.	D	.208	.397	.287	22.2
11.	D	.594	.982	.624	74.7
12.	A	.365	.397	.192	25.6
13.	D	.469	.625	.324	31.6
14.	A	.656	.440	.298	28.3
15.	A	.875	.141	-.006	5.1
16.	A	.635	.625	.212	31.3
17.	B	.510	.790	.377	46.8
18.	D	.958	.218	.078	3.7
19.	C	.688	.094	.052	5.4
20.	C	.625	.869	.422	55.9
21.	C	.833	.203	.159	10.8
22.	D	.573	.440	.318	29.0
23.	C	.667	.339	.181	21.5
24.	B	.646	.294	.159	18.5
25.	B	.438	.924	.568	64.6
26.	B	.656	.031	.112	1.7
27.	B	.885	-.294	-.116	-11.4
28.	B	.469	.800	.385	48.1
29.	A	.906	.294	.175	12.5
30.	C	.490	.673	.304	36.4

AREA: ORNAMENTAL HORTICULTURE

Unit: Pruning Trees and Shrubs

Student Performance Objectives

The student should be able to:

1. When given an injured tree or shrub, demonstrate the procedure for removing and/or repairing the injury to the satisfaction of the teacher or industry standards.
2. When given a shrub in need of rejuvenation, remove the necessary wood to restore the shrub's youthful appearance according to industry recommendations.
3. When given an odd shape shrub, recommend corrective pruning procedures to develop a more balanced and compact appearance to the satisfaction of the instructor or employer.
4. When given a formal hedge and the intended conformation, shear it to maintain a thick and compact growth which will match the desired conformation.

AREA: ORNAMENTAL HORTICULTURE

Unit: Pruning Trees, Shrubs and Hedges (5-2)

1. Broken branches of a plant should be removed:

   A. just above a strong lateral branch
   B. just below any lateral branches
   C. only in the spring
   D. only during winter dormacy

2. In order for shrubs such as Red and Yellow Dogwood, Kerria, and some low-growing shrub roses to produce their most brilliant colors:

   A. prune only every third year
   B. remove about 1/3 rd of the old wood each year
   C. never prune the plant
   D. prune out only new wood

3. Removing the longer shoots of a shrub in order to obtain a more balanced and compact appearance is called:

   A. girdling
   B. leadering
   C. suckering
   D. heading back

4. In order to prevent infection open wounds greater than one inch diameter should be painted with:

   A. 2,4-D
   B. asphalt emulsion
   C. diethystilbestrol
   D. house paint

5. Cutting the leader or terminal branches of evergreens causes:

   A. more branching
   B. more terminal growth
   C. root rot
   D. red spider damage

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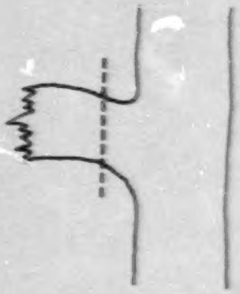
Removing half the "candle" is:

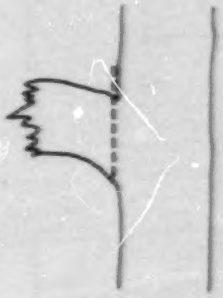
A. a method of pruning pines
B. a method of pruning junipers
C. a means of hardening off bedding plants
D. a technique of budding

When removing a broken limb which of the following would be the best cut?

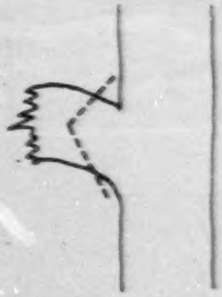
A.



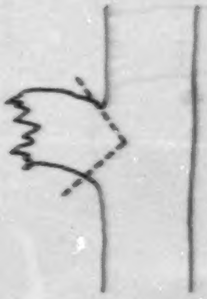
C.



B.



D.



Many old deciduous shrubs are best rejuvenated to produce new wood by:

A. cutting all wood to the ground line in March Or April
B. spading deeply about 6" all around the plant to cut roots
C. removing flowers
D. grafting

9. The recommended pruning time for early spring flowering deciduous shrubs is:

A. late winter
B. before flowering in spring
C. after flowering in spring
D. early fall

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10. Before repairing a rotted limb cavity it is important to:

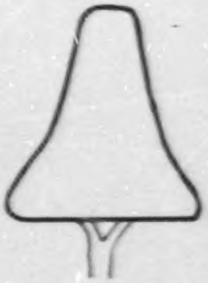
    A. remove all rotted material from the cavity
    B. make sure the tree is not deciduous
    C. remove any branches directly above the cavity
    D. make sure the tree is not an evergreen

11. Certain over-grown narrow-leafed evergreens (taxus, most junipers) may be "headed back" by removing:

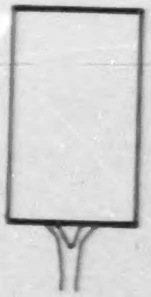
    A. a portion of long branches 1/4 inch beyond a strong lateral
    B. the entire plant just above ground level
    C. flower buds
    D. all of the lower branches

12. The least desirable shape of hedge for the leaves to receive maximum light is:

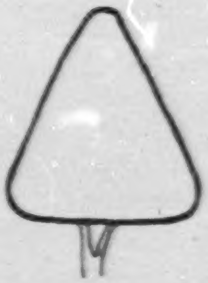
A.



C.



B.



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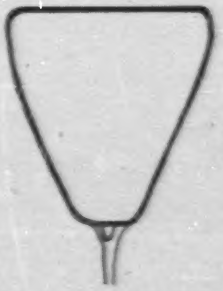

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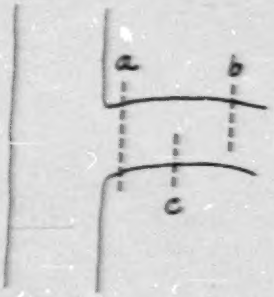
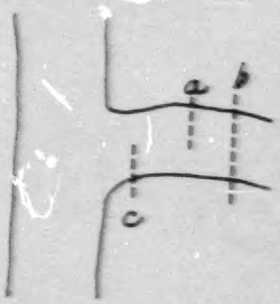
13. When making the cuts to remove a large branch do it in a,b,c order as in illustration:

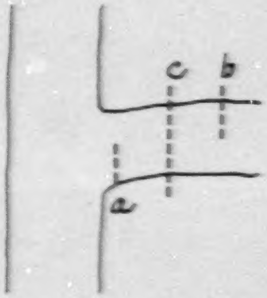
A.



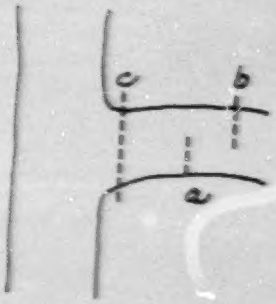
C.



B.



D.



14. A deciduous hedge should be trimmed:

A. so that its sides are vertical
B. so that it is broader at the base than at the top
C. in early winter
D. in late fall

15. Shearing plants to form animals or other figures is called:

A. Espailier
B. Arbor
C. Trellis
D. Topiary

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16. Bark injuries to trees should be repaired by:

- A. removing damaged bark and shaping the wound so that it is pointed at the top and bottom
- B. removing loose bark and shaping the wound into a circle
- C. making a bridge graft over the damaged spot
- D. both B and C above

17. Spirea and Forsythia should be pruned:

- A. in early spring
- B. when dormant
- C. after flowering
- D. at any time

18. An Espalier is:

- A. a plant trained to basically two dimensions
- B. a plant trained to an unusual three dimensional shape
- C. a plant limbed up very high
- D. a plant which has been double grafted

END OF TEST

TABLE: 5-2 S
AREA: Ornamental Horticulture
TEST NO.: 5-2
KUDER-RICHARDSON 20: .709
KUDER-RICHARDSON 21: .630
N(tests) = 36

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	A	.250	.876	.420	50.0
2.	B	.194	.637	.277	28.9
3.	D	.361	.992	.696	80.0
4.	B	.444	.992	.604	80.0
5.	A	.500	.951	.533	68.9
6.	A	.611	.685	.235	35.6
7.	C	.389	.740	.331	38.9
8.	A	.694	.707	.356	34.4
9.	C	.750	.707	.410	34.4
10.	A	.306	.924	.442	60.0
11.	A	.389	.965	.605	70.0
12.	D	.611	.685	.201	35.6
13.	D	.444	.884	.587	57.8
14.	B	.417	.800	.417	47.8
15.	D	.972	.000	.016	00.0
16.	A	.722	.809	.409	45.6
17.	C	.806	.264	.082	12.2
18.	A	.833	.853	.475	44.4
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

TABLE: 5-2 A
AREA: Ornamental Horticulture
TEST NO.: 5-2
KUDER-RICHARDSON 20: .773
KUDER-RICHARDSON 21: .739
N(tests) = 98

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	A	.520	.905	.467	60.4
2.	B	.265	.884	.446	54.6
3.	D	.490	.918	.495	63.3
4.	C	.561	.740	.375	41.5
5.	A	.408	.891	.463	57.5
6.	A	.612	.924	.500	61.1
7.	C	.245	.861	.451	48.3
8.	A	.429	.818	.397	49.5
9.	C	.612	.836	.446	51.9
10.	A	.163	.696	.342	30.5
11.	A	.418	.905	.497	60.4
12.	D	.378	.869	.488	56.4
13.	D	.286	.935	.542	62.1
14.	B	.500	.960	.551	70.8
15.	D	.541	.960	.522	70.8
16.	A	.806	.063	.057	2.8
17.	C	.480	.844	.423	53.0
18.	A	.735	.988	.658	76.0
19.					
20.					
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30.					

AREA: ORNAMENTAL HORTICULTURE

Unit: Planting Media Preparation

Student Performance Objective

The student should be able to:

1. When given a choice of materials, select those that meet basic requirements, and prepare the following media: (1) rooting, (2) potting, (3) fine seeded, according to industry standards.

2. When given a chemical sterilant, demonstrate the procedure, with proper safety precautions, in pasteurizing a bench of media according to industry standards.

3. When given a bench of media needing pasteurizing demonstrate the recommended method for steam pasteurization to the satisfaction of the instructor and according to industry standards.

AREA: ORNAMENTAL HORTICULTURE

Unit: Planting Media Preparation
(5-3)

1. Compared to a media for bedding plants, a potting media would have:

   A. a higher per cent sand
   B. the same proportion of sand
   C. a lower per cent sand
   D. a lower per cent of peat

2. The one type of soil sterilant which does not require the soil to be covered by a tarp of any kind during treatment is:

   A. formaldehyde
   B. methl bromide
   C. 2,4-D
   D. Vapam

3. When pasteurizing soil a temperature of 180 degrees fahrenheit is needed for:

   A. one hour
   B. two hours
   C. one and one-half hours
   D. one-half hour

4. Heavy soils of clay and light soils of sand are often modified before transplanting nursery stock. The soil modification enables:

   A. light soil to absorb water more rapidly
   B. heavy soils to hold more nutrients
   C. heavy soils to provide better aeration
   D. light soils to be more porous

5. Before adding micronutrients to a planting media, one should:

   A. make sure all micronutrients are added to the media
   B. make a thorough analysis of the planting media for nutrient content
   C. add only the most common micronutrients
   D. they are not important, don't add any

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6. Formalin is used on planting media by some greenhouse managers for the purpose of:

A. providing a systemic type of insecticide
B. adding necessary plant nutrients
C. lowering the pH of the soil for acid type plants
D. chemically sterilizing against harmful organisms

7. Using steam to pasteurize the bench:

A. costs less than chemical sterilants and is also effective against hard-to-kill organisms
B. costs less than chemicals but is not as effective on hard-to-kill organisms
C. has the advantage over chemical sterilants because over treatment will not hasten decomposition or organic matter
D. does not require the use of a cover during treatment as does chemical sterilants

8 A mixture of 90% sphagnum moss and 10% clean sand is a correct mixture for a rooting media

A. true
B. false

9. Soil structure refers to the:

A. type of soil particle
B. arrangement of particles in the soil
C. weight of particles in the soil
D. size of soil particles

10. How many days must soil be aired after treatment by methyl-bromide?

A. one day
B. ten days
C. fourteen days
D. thirty days

11. Using aerated steam (mixture of air and steam) at 140 degrees for steam pasteurizing benches:

A. the desirable organisms are killed but undesirable organisms remain alive
B. will have no affect on disinfecting the soil
C. will kill many undesirable organisms while beneficial forms remain alive
D. is 40 degrees higher temperature than is needed

GO TO NEXT PAGE

12. A planting media is in need of soil conditioner if:

    A. it drains too rapidly
    B. it drains too slowly
    C. it is very compacted and hard
    D. all of the above

13. Which soil particle has the lowest nutrient holding capacity?

    A. sand
    B. silt
    C. clay
    D. organic matter

14. One of the characteristics of both Vapam and formaldehyde is that:

    A. they are soil sterilants which require no waiting period after treatment
    B. they are systemic insecticides
    C. they are soil sterilants which require about 14 days waiting period after treatment
    D. they are for preserving floral displays

15. Once soil is thoroughly sterilized:

    A. it can easily be reinfected by walking over it or placing infected tools or pots on the surface
    B. is immune to reinfection for a year
    C. is more immune to reinfection than unsterilized soil
    D. only those types of organisms which were previously not in the soil can reinfect

Soil granulation is desirable because it:

    A. tends to improve aeration and drainage
    B. decreases the amount of air
    C. breaks down the soil structure
    D. all the above

17. Organic matter added to the soil:

    A. adds large amounts of fertilizer
    B. improves soil structures
    C. decreases the texture
    D. all of the above

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18. A good soil for root development has:

    A. 50% air space, 25% solid matter, and 25% water
    B. 50% solid matter, 25% air space, and 25% water
    C. 50% water, 25% air space, and 25% solid matter
    D. 50% solid matter and 50% water

19. Whenever large amounts of sand and peat are used to alter the physical condition of the soil, it will be necessary to adjust certain maintenance practices which are:

    A. fertilization and mowing
    B. fertilization and spraying for weeds
    C. mowing and spraying for weeds
    D. fertilization and irrigation

END OF TEST

TABLE: 5-3 S
AREA: Ornamental Horticulture
TEST NO.: 5-3
KUDER-RICHARDSON 20: .378
KUDER-RICHARDSON 21: .216
N(tests) = 20

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	C	.200	-.661	-.185	-20.0
2.	D	.850	.836	.515	40.0
3.	D	.850	.836	.457	40.0
4.	C	.500	.941	.554	60.0
5.	B	.150	.440	.118	16.7
6.	D	.450	.000	.791	100.0
7.	A	.750	.941	.534	60.0
8.	B	.550	-.233	-.047	-13.3
9.	B	.400	-.110	.075	-6.7
10.	B	.350	-.110	-.067	-6.7
11.	C	.400	-.411	-.092	-26.7
12.	D	.100	.750	.390	33.3
13.	A	.400	.996	.579	83.3
14.	C	.650	-.411	-.235	26.7
15.	A	.400	.996	.620	83.3
16.	A	.600	.770	.344	43.3
17.	B	.600	.918	.344	63.3
18.	B	.250	.869	.510	50.0
19.	D	.200	.750	.329	33.3
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

TABLE: 5-3 A
AREA: Ornamental Horticulture
TEST NO.: 5-3
KUDER-RICHARDSON 20: .682
KUDER-RICHARDSON 21: .665

N(tests) = 144

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.479	.411	.250	27.1
2.	D	.694	.047	.047	2.5
3.	D	.569	.836	.443	52.1
4.	C	.639	.696	.337	36.7
5.	B	.319	.924	.558	62.1
6.	D	.507	.649	.295	33.3
7.	A	.563	.869	.488	56.3
8.	B	.389	.760	.375	43.3
9.	B	.486	.818	.394	50.4
10.	B	.653	.141	.089	8.3
11.	C	.444	.898	.508	60.4
12.	D	.354	.905	.516	59.6
13.	A	.472	.946	.501	68.3
14.	C	.583	.696	.356	37.5
15.	A	.507	.876	.497	57.1
16.	A	.590	.790	.441	47.1
17.	B	.639	.413	.292	30.0
18.	B	.451	.941	.563	67.1
19.	D	.438	.740	.348	42.1
20.					
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30.					

AREA: ORNAMENTAL HORTICULTURE

Unit: Arranging and Designing with Flowers and Decorative Materials

Student Performance Objectives

The student should be able to:

1. When given a variety of cut flowers, decorative plant material and accessories, and an order for an arrangement, select the basic design shape, an appropriate container and arrange the flowers using approved techniques to the satisfaction of the instructor.

2. When given adequate plant materials, container, and accessories, construct each of the following arrangements to the satisfaction of the instructor or employer:

   A. centerpiece
   B. hospital arrangement
   C. corsage
   D. basket
   E. wedding bouquet

AREA: ORNAMENTAL HORTICULTURE

Unit: Arranging and designing with flowers and decorative materials (5-4)

1. The relationship in size of one part of a floral arrangement to another part is called:

   A. unity
   B. focal point
   C. harmony
   D. scale

2. When designing centerpieces for dining or coffee tables a good design would be:

   A. low horizontal design to be viewed from all sides
   B. a high vertical design to be viewed from all sides
   C. a high oval design
   D. a horizontal design to be viewed only from one side

3. The underlying skeleton or linear pattern which holds an arrangement together is called:

   A. form
   B. line
   C. scale
   D. pattern

4. Which foliage would be most appropriate for constructing a boutonniere?

   A. salal
   B. white pine (emerald leaf)
   C. baker fern (leatherleaf fern)
   D. huckleberry

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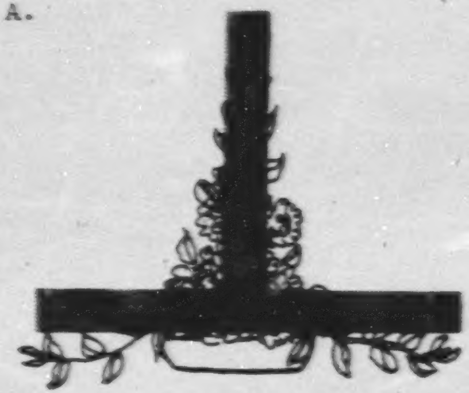
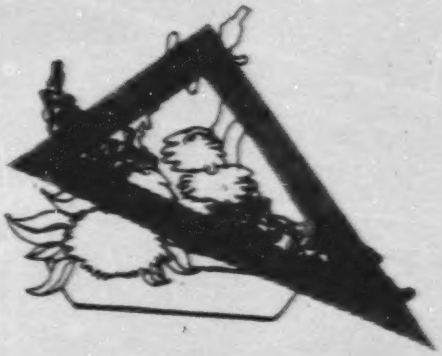
5. Which of the following basic designs in floral arrangements would be called asymmetrical triangle?

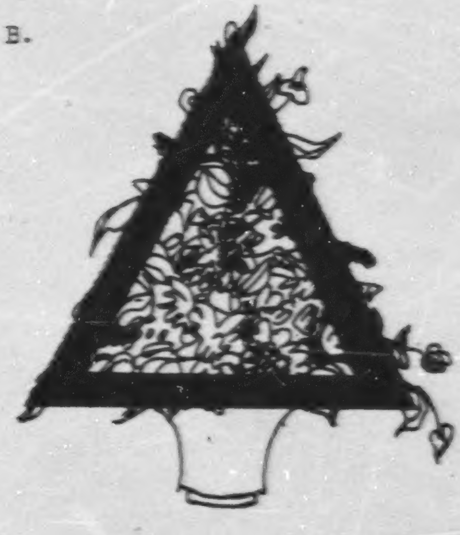
A.



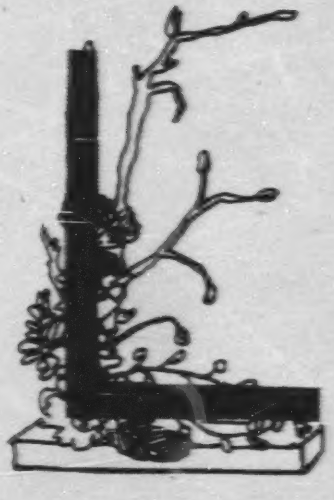
C.



B.



D.



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6. A practice to avoid in floral design is:

A. to use no more than four colors
B. small flowers toward the bottom and center of the arrangement and large flowers toward the top and edges
C. dark colors toward the bottom of the arrangement
D. three light flowers for each dark flower if flowers are of equal size

7. Popular bouquets for weddings are of the:

A. colonial, cascade or crescent design
B. basket, base or spray category
C. potted foliage type
D. low horizontal designs

8. The use of different colors, sizes, or textures of materials in a floral arrangement to produce a contrast is called:

A. rhythm
B. accent
C. repetition
D. scale

9. The most popular type of corsage sold by florists for weddings is the:

A. shoulder corsage
B. waist corsage
C. wrist corsage
D. corsage worn in the hair

10. To achieve attractive floral design a guideline would be to:

A. use at least four colors of flowers
B. use three dark flowers for each light one when the flowers are of equal size
C. use an uneven number of flowers when the total to be used is less than 12
D. place dark colors of flowers towards the top of the arrangement and light colors lower

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11. Which of the following would be the most appropriate type flowers to have available for corsages and other floral arrangements for Mother's Day.

A. Roses, Carnations and Poinsettia
B. Gladioli, Peonies
C. Easter Lilies, Azaleas
D. Roses, Carnations, and Orchids

12. A general rule for the width of bows for corsage ribbons is that the bow width should:

A. be about ½ the width of the fullest part of the corsage
B. be wider than the width of the fullest part of the corsage
C. not be greater than the fullest part of the corsage

13. The wire with the largest diameter would be a:

A. 12" long 28 gauge
B. 9" long 24 gauge
C. 6" long 22 gauge
D. 4" long 28 gauge

14 Hardening cut flowers in lukewarm water to increase the time they stay fresh is recommended for most flowers except for:

A. roses
B. carnation
C. gardenia
D. pompon

15. The Bird of Paradise or Cymbidiums would be more appropriately worn by:

A. a small, dainty girl
B. an average-sized girl, reserved personality
C. a tall, stately girl, outgoing personality
D. a girl with quiet nature

16. The type of occasion for which a Cattleya Orchid might be recommended is:

A. street or sport event
B. very special, such as dinner-dance
C. somewhat casual, such as coffee hour welcoming new neighbor
D. with the wearing of woolens, tweeds or corduroys

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17. A plant that would typically be used for foliage in flower arrangement would be:

A. Boston Fern
B. Azalea
C. Chines Evergreen
D. Baker Fern

18. The Rhododendron is primarily used as a:

A. flowering pot plant
B. foliage pot plant
C. foliage for flower arrangements (greens)

19. Flower shapes are sometimes classed into the groups called Line, Mass, Form, and Filler. An example of flowers which would be included in the Line classification would be:

A. Larkspur, Stocks, Snapdragons, Gladiolus
B. Carnations, Roses, Daisies, Peonies
C. Bird of Paradise, Calla Lilies, Daffodils
D. Sprays of Lilac, Heather, Candy Tufts

END OF TEST

TABLE: 5-4 S
AREA: Ornamental Horticulture
TEST NO.: 5-4
KUDER-RICHARDSON 20: .373
KUDER-RICHARDSON 21: .239
N(tests) = 18

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D	.500	-.661	-.157	-35.0
2.	A	.167	.898	.511	50.0
3.	B	.833	.800	.271	40.0
4.	C	.556	.249	.000	15.0
5.	C	.611	.990	.575	80.0
6.	B	.667	.625	.190	20.0
7.	A	.556	.661	.496	35.0
8.	B	.611	.661	.253	35.0
9.	A	.167	.898	.391	50.0
10.	C	.389	.898	.391	50.0
11.	D	.167	.718	.150	25.0
12.	C	.556	.918	.361	60.0
13.	C	.278	.094	.275	5.0
14.	A	.722	-.094	-.075	- 5.0
15.	C	.778	.249	.162	15.0
16.	B	.333	.388	.571	75.0
17.	D	.444	.861	.541	55.0
18.	C	.722	.918	.426	60.0
19.	A	.444	.094	.135	5.0
20.					
21.					
22.					
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TABLE: 5-4 A
AREA: Ornamental Horticulture
TEST NO.: 5-4
KUDER-RICHARDSON 20: .504
KUDER-RICHARDSON 21: .404

N(tests) = 66

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	D	.576	.869	.349	56.3
2.	A	.182	.844	.430	43.8
3.	B	.455	.818	.401	50.0
4.	C	.455	.876	.345	56.3
5.	C	.424	.397	.282	25.0
6.	B	.303	.941	.472	62.5
7.	A	.303	.718	.302	37.5
8.	B	.303	.918	.472	56.3
9.	A	.333	.876	.457	56.3
10.	C	.273	.941	.539	62.5
11.	D	.076	.172	.126	6.3
12.	C	.515	.383	.227	25.0
13.	C	.470	.760	.337	43.8
14.	A	.848	-.141	-.030	-6.3
15.	C	.258	.918	.366	56.3
16.	B	.273	.397	.176	18.8
17.	D	.318	.411	.278	25.0
18.	C	.848	-.750	-.263	-31.3
19.	A	.394	.956	.539	68.8
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30.					

AREA: ORNAMENTAL HORTICULTURE

Unit: Grafting and Budding

Student Performance Objectives

The student should be able to:

1. When given nursery stock to be propagated by grafting and the necessary tools and materials, demonstrate the ability to propagate plants from grafting, using one or more methods including cleft grafting, bench grafting, side grafting, and bark grafting according to recommended procedures.

2. When given plants to be propagated by budding, demonstrate the ability to propagate plants from budding using the T-bud or shield technique, as well as demonstrate the process for caring for plants after the budding procedure.

AREA: ORNAMENTAL HORTICULTURE

Unit: Grafting and Budding (5-5)

1. Which of the following is not true concerning grafting as a method of propagation?

   A. grafting is used to propagate varieties which cannot be conveniently propagated by other methods
   B. grafting is used to change the variety on an established plant (tap working)
   C. grafting is used because it is easier and less expensive than cuttings
   D. grafting is used to utilize benefits from certain rootstocks

2. Budding should be done in:

   A. spring or when bark slips easily
   B. winter during dormant stage of plant
   C. in any stage of plant development

3. Bud grafting should be done when:

   A. both the stock and the bud are dormant
   B. the stock is dormant and the bud is actively growing
   C. the stock is actively growing and the bud is dormant
   D. both the stock and the bud are actively growing

4 Budding is a method of:

   A. sexual propagation
   B. asexual propagation
   C. bark grafting
   D. scion grafting

5. The layer of cells located immediately under the bark is the:

   A. cambuim
   B. scion
   C. xylem
   D. phloem

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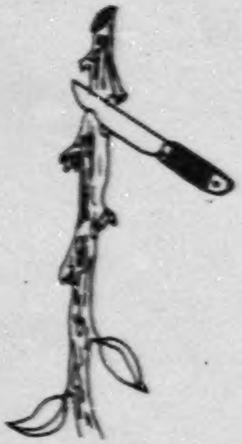
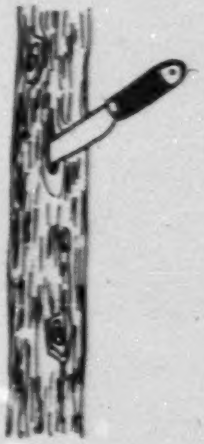
6. A whip is normally known as:

A. a seedling
B. a pruned-off branch
C. a scion
D. A and C

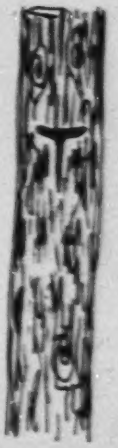
The procedure indicated in the drawings below will be used to answer questions 7 through 9.



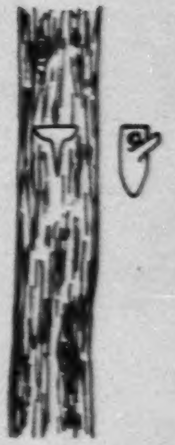
step #1



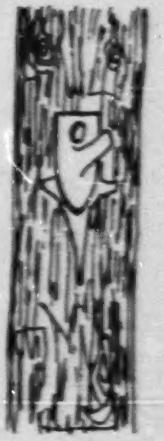
step #2



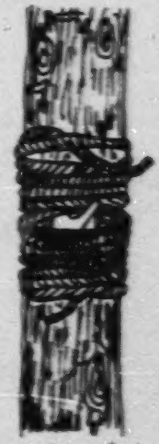
step #3



step #4



step #7



step #6

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7. This procedure of operation is called:

   A. terminal stem grafting
   B. cleft grafting
   C. bud grafting
   D. none of the above

8 The "T" cut in step 3 should be made:

   A. upside down in areas of high rainfall or for plants which bleed heavily
   B. at the site of the bud
   C. through the bark and one layer of inner wood
   D. at any depth depending on convenience

9. In the final stage the graft is wrapped to:

   A. keep the sun off
   B. keep it moist
   C. hold the graft in place
   D. both B and C

10. A method of propagation where the new plant gets its food and water supply from the mother plant is known as:

   A. division
   B. layering
   C. graftage
   D. none of the above

11. Whip grafting is best done in:

   A. fall
   B. summer
   C. late winter or early spring
   D. any time of year is equally satisfactory

12. The stock that is to be cleft grafted should:

   A. be cut diagonally across the end with a notch at the center
   B. be allowed to form a callus before joining the scion
   C. be cut squarely across the end and the split 2 or 3 inches across the center
   D. have the bark removed entirely around the stock at the point to be grafted

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13. The most common method of budding because it is fast easy and often effective is the:

A. chip bud
B. patch bud
C. t-bud
D. flute bud

14. The mass of cells that develops from and around the wounded plant tissue at the junction of a graft union is called the:

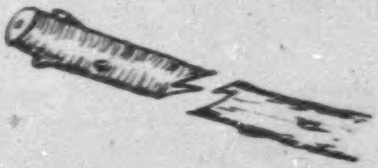
A. callus
B. cambium
C. bridge
D. scion

15. At the time of grafting the buds on the scion part of the graft should be:

A. growing actively
B. removed
C. dormant
D. covered with wax

16. The illustration shows an example of a type of graft called:

A. top grafting
B. cleft grafting
C. approach grafting
D. whip grafting



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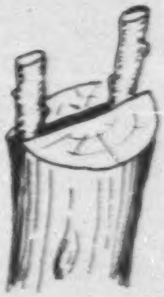
17. The illustration is an example of a type of graft called:

A. approach graft
B. cleft graft
C. whip or tongue graft
D. bridge graft



18. When grafting, the upper portion of the graft from which the new stem and branches are grown is called the:

A. scion
B. stock
C. cambium
D. callus

19. Trees which have had their trunks damaged or girdled, but still have good root systems may be repaired by:

A. bark grafting
B. approach grafting
C. bridge grafting
D. cleft grafting

20. A type of budding which may be used when the bark will not peel or slip easily would be:

A. patch bud
B. plate bud
C. flute bud
D. chip bud

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21. The location for budding roses would be:

A. at or slightly below the soil surface
B. about one foot above ground level
C. at the furthest point of growing tips
D. at location of any previous buds

22. Another name for T-budding is:

A. patch budding
B. shield budding
C. chip budding
D. grafting

END OF TEST

TABLE: 5-5 S
AREA: Ornamental Horticulture
TEST NO.: 5-5
KUDER-RICHARDSON 20: .664
KUDER-RICHARDSON 21: .613

N(tests) = 86

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.488	.673	.344	36.0
2.	A	.419	.264	.161	17.1
3.	D	.651	.203	.209	12.5
4.	B	.372	.047	.101	2.7
5.	A	.267	.869	.428	51.7
6.	D	.733	.413	.258	27.5
7.	C	.442	.972	.606	73.6
8.	A	.802	.760	.439	38.7
9.	D	.198	.454	.267	25.5
10.	B	.744	.707	.267	35.0
11.	C	.360	.718	.383	39.9
12.	C	.593	.718	.304	39.5
13.	C	.465	.844	.413	51.4
14.	A	.326	.956	.563	66.7
15.	C	.581	.625	.312	32.1
16.	D	.442	.992	.625	81.2
17.	B	.360	.918	.516	62.5
18.	A	.512	.718	.353	39.7
19.	C	.523	.800	.344	46.9
20.	D	.709	.203	.221	12.5
21.	A	.837	.454	.162	23.4
22.	B	.512	.790	.429	47.2
23.					
24.					
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TABLE: 5-5 A
AREA: Ornamental Horticulture
TEST NO.: 5-5
KUDER-RICHARDSON 20: .662
KUDER-RICHARDSON 21: .606

N(tests) = 22

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.545	.110	.063	7.1
2.	A	.227	.707	.342	35.7
3.	D	.409	.339	.235	21.4
4.	B	.682	-.353	-.141	-19.0
5.	A	.409	.998	.726	83.3
6.	D	.909	.411	.092	14.3
7.	C	.455	.951	.371	69.0
8.	A	.864	-.047	.098	-2.4
9.	D	.591	-.110	-.054	-7.1
10.	B	.864	-.413	-.050	-16.7
11.	C	.500	.951	.635	69.0
12.	C	.636	.368	.247	23.8
13.	C	.455	.951	.524	69.0
14.	A	.318	.998	.687	83.3
15.	C	.636	.156	.089	9.5
16.	D	.500	.951	.585	69.0
17.	B	.455	.861	.422	54.8
18.	A	.591	.951	.644	69.0
19.	C	.773	.969	.720	71.4
20.	D	.409	.861	.468	54.8
21.	A	.682	.969	.677	71.4
22.	B	.636	.368	.142	23.8
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AREA: ORNAMENTAL HORTICULTURE

Unit: Maintaining Turf Fertility

Student Performance Objectives

The student should be able to:

1. When given a specific turf area, take a representative soil sample and prepare the sample for analysis by a recognized soil testing laboratory to the satisfaction of the teacher or employer.

2. When given a soil test report, interpret the recommendations in terms of amount, rate and analysis of fertilizer to apply with complete accuracy.

3. When given a set of fertilizer recommendations, select the most efficient and economical fertilizer for the turf area and apply the fertilizer and/or lime according to recommended procedures.

AREA: ORNAMENTAL HORTICULTURE

Unit: Maintaining Turf Fertility

(5-6)

1. When selecting a soil sample to determine the need for fertilizer, the best tool to use is a:

A. hoe
B. spade
C. auger
D. probe

2 The pH of the soil refers to:

A. the degree of acidity of the soil
B. the concentration of hydrogen ions in the soil solution
C. hydrolisis of water in the soil
D. the ratio of calcium to sulfur in the soil

3. When using lime on a soil to correct acidity, a primary consideration should be the affect the lime will have on:

A. the change in soil structure and drainage
B. the availability of fertilizers nutrients
C. soil microorganisms and insects
D. the effectiveness of pesticides applied to the soil

4. A soil test indicates whether the soil:

A. is low or high in nutrients
B. has good structure
C. is contaminated with pesticides
D. is poorly drained

5 Which of the following would be used to raise soil pH?

A. calcium carbonate
B. aluminum sulfate
C. sulfur
D. iron sulfate

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6. The release of nitrogen from slowly available fertilizers does not depend upon:

A. amount of moisture in the soil
B. type of crop being grown
C. soil temperature
D. soil pH (acidity)

7. Which of the following statements about soil sampling is incorrect?

A. sample when soil moisture conditions are suitable for plowing
B. remove sod or top debris before sampling
C. sample lawn areas to a three to six inch depth
D. slowly oven-dry samples before crushing and mixing

8.. Which soil component has the greatest ability to hold nutrients?

A. sand
B. silt
C. clay
D. gravel

9. The form of lime recommended for use on turfgrass areas is:

A. ground limestone
B. burned lime (calcium oxide)
C. hydrated lime (calcium hydrate)
D. marl

10. A primary reason why soil samples being prepared for laboratory chemical analysis should not be dried by oven heat is because:

A. it increases the total phosphorus of the soil
B. excessive drying may increase the amount of potassium extracted to an artifically high level
C. soil organisms will be killed preventing accurate analysis
D. heat dries off the CO_2 and decreases the pH

11. In a 50 pound bag of fertilizer having an analysis of 15-10-5, how many pounds of phosphorus are present?

A. 15
B. 10
C. 5
D. 20

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12. It is advised to fertilize the lawn frequently throughout the season The element that is in constant short supply and is the major reason for repeated fertilization is:

    A. nitrogen (N)
    B. phosphorus (P)
    C. potassium (K)
    D. iron (Fe)

13. How many pounds of actual nitrogen are contained in a 50 pound bag of 10-6-4 fertilizer?

    A. 6 pounds
    B. 5 pounds
    C. 10 pounds
    D. 20 pounds

14. To add a supply of sulfur and calcium to the soil but not significantly change the pH, one would add:

    A. dolomitic limestone
    B. gypsum
    C. calacitic limestone
    D. flowers of sulfur

15. The depth for taking a soil analysis for a turf grass area is mainly determined by the:

    A. soil texture
    B. depth of turf roots
    C. soil fertility level
    D. annual inches of rainfall

16. Phosphorus contributes greatly to:

    A. stalk strength
    B. root development
    C. vegetative growth
    D. flowering

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17. The reason for sampling a number of spots rather than just one for a soil analysis of a turf area is:

A. more soil is needed for sample analysis than can be obtained from one probe
B. that small samples can be taken so that no one spot on the turf area is damaged excessively
C. to be sure to get a more representative sample of the general nutrient needs of the area
D. to permit individual tests for each of the plant nutrients in the soil

18. If a 2:1:1 ratio of fertilizer nutrients is called for in a soil analysis, then a fertilizer with the following chemical composition could be used:

A. 20-10-10
B. 12-6-6
C. 20-5-5
D. both A and B

19. Urea would be used to apply the plant nutrient of:

A. nitrogen
B. phosphorus
C. potassium
D. manganese

20. The type of grass which would require the least nitrogen:

A. Merion bluegrass
B. Kentucky bluegrass
C. Windsor
D. Pennstar

END OF TEST

TABLE: 5-6 S
AREA: Ornamental Horticulture
TEST NO.: 5-6
KUDER-RICHARDSON 20: .530
KUDER-RICHARDSON 21: .418

N(tests) = 86

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D	.674	.339	.183	20.1
2.	B	.721	.770	.388	42.0
3.	B	.581	.047	.056	3.0
4.	A	.070	.637	.311	20.8
5.	A	.686	.718	.303	37.9
6.	B	.709	.760	.343	42.4
7.	D	.884	-.078	.001	-3.4
8.	C	.267	.661	.269	32.2
9.	A	.616	.661	.311	34.1
10.	B	.733	.279	.073	15.2
11.	C	.721	.818	.433	46.2
12.	A	.384	.884	.446	57.2
13.	B	.709	.898	.398	54.9
14.	B	.686	.818	.329	46.2
15.	B	.581	.930	.545	65.2
16.	B	.605	.264	.172	15.9
17.	C	.209	.876	.504	50.0
18.	D	.372	.935	.522	65.5
19.	A	.826	.861	.497	45.5
20.	B	.570	.397	.268	26.1
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

TABLE: 5-6 A
AREA: Ornamental Horticulture
TEST NO.: 5-6
KUDER-RICHARDSON 20: .326
KUDER-RICHARDSON 21: .160
N(tests) = 30

Item	Correct Option	Relative Diffi- culty	Phi Coeff- icient	Point Biserial Coefficient	Discrim- ination Index
1.	D	.200	.800	.441	37.5
2.	B	.833	.440	.308	25.0
3.	B	.533	.000	.114	00.0
4.	A	.267	.440	.064	25.0
5.	A	.767	.696	.165	25.0
6.	B	.467	.397	.273	25.0
7.	D	.467	.203	.190	12.5
8.	C	.433	.918	.465	62.5
9.	A	.800	.884	.558	50.0
10.	B	.933	-.397	-.180	-12.5
11.	C	.567	.383	.146	25.0
12.	A	.367	.696	.271	37.5
13.	B	.867	.696	.181	25.0
14.	B	.600	.696	.377	37.5
15.	B	.467	.383	.162	25.0
16.	B	.400	.203	.045	12.5
17.	C	.233	.884	.519	50.0
18.	D	.333	.918	.565	62.5
19.	A	.767	.941	.524	62.5
20.	B	.567	.203	.146	12.5
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

AREA: ORNAMENTAL HORTICULTURE

Unit: Turf Weed Control

Student Performance Objectives

The student should be able to:

1. When given a situation of weed infestation of a turf area, identify the weed and carry out the appropriate chemical, cultural, and/or mechanical procedures processes necessary for controlling the weeds.

2. When given chemical weed control sprayers, demonstrate the ability to properly calibrate the sprayer, and following use, clean the equipment for storage.

AREA: ORNAMENTAL HORTICULTURE

Unit: Turf Weed Control (5-7)

1. The best time to control crabgrass in lawns is:

   A. spring
   B. summer
   C. fall
   D. winter

2. After using a 2,4-D solution in a sprayer, the sprayer can be cleaned of all residue:

   A. by merely rinsing briefly with water
   B. by a very intensive water rinse
   C. by using a water-detergent solution
   D. only by flushing with a water-detergent solution, then filling the tank and prime system with an ammonia solution for 24 hours, then water-flushing

3. Dandelion is a common perennial weed which is best controlled by:

   A. 2,4 - D
   B. 2,4,5 - D
   C. Sevin
   D. Diazinon

4. A sprayer which sprays a 20 foot wide pattern was checked and found to be spraying 10 gallons of material after traveling 600 feet. Knowing that there are 43,560 square feet in one acre, it can be determined that the sprayer has a spray rate of:

   A. 12.0 gallons per acre
   B. 22.6 gallons per acre
   C. 36.3 gallons per acre
   D. 43.56 gallons per acre

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5. Which of the following is least important to pre-emergence herbicide effectiveness?

   A. soil type
   B. soil cultivation practices
   C. soil moisture
   D. soil phosphorus level

6. If it is found that the amount of spray applied per acre needs to be decreased, a procedure which would accomplish this is to:

   A. decreasing the tractor gear used (example from 4 to 3) and keeping all other settings the same
   B. decreasing the throttle speed, and keeping all other settings the same
   C. increasing the tractor gear used and decreasing pump pressure
   D. decreasing both the gear used and the throttle setting

7. Chloro-IPC, Casoron, Simazine, and Treflan are all:

   A. post-emergence herbicides
   B. soil fumigants
   C. pre-emergence herbicides
   D. fungicides

8. By increasing the pump pressure on a sprayer and also the gear used while spraying (example, going from 2nd gear to 3rd gear) the result will be:

   A. the equipment may spray less material per acre if the forward speed is increased considerably but pressure increase is small
   B. the equipment will always spray more material per acre because both adjustments increase spray rate
   C. the equipment will spray less material per acre because both adjustments decrease the rate of spray
   D. the equipment may spray more material per acre only if the forward speed is changed greatly and the pressure increase is small

GO TO NEXT PAGE

9. A herbicide is used to control:

   A. insects
   B. diseases
   C. plants
   D. all of the above

10. A recommendation for herbicide application states that 2 pounds of the active herbicide should be applied per acre and the amount of solution applied per acre should be 50 gallons. The label on the herbicide concentrate states that there are 4 pounds of the active ingredient per gallon of concentrate. Which of the choices provide the correct amounts of water and herbicide concentrate to give proper solution for spraying one acre?

    A. 1/2 gallon of concentrate and 49-1/2 gallons of water
    B. 2 gallons of concentrate and 48 gallons of water
    C. 2 pounds of concentrate and 50 gallons of water
    D. 4 gallons of concentrate and 46 gallons of water

11. The chemical 2,4-D is used for weed control. Which weed is not killed by 2,4 - D?

    A. Yellow Rocket
    B. Buckhorn
    C. Crabgrass
    D. Curly Dock

END OF TEST

TABLE: 5-7
AREA: 5-7
TEST NO.:
KUDER-RICHARDSON 20:
KUDER-RICHARDSON 21:

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	A				
2.	D				
3.	A				
4.	C				
5.	D				
6.	C				
7.	C				
8.	A				
9.	C				
10.	A				
11.	C				
12.					
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AREA: ORNAMENTAL HORTICULTURE

Unit: Landscape Insect and Disease Control

Student Performance Objectives

The student should be able to:

1. Given ten landscape plant specimens damaged by disease, insects or pests, recognize the source of the damage, either on sight or using a recognized reference.
2. Given a recognized reference and landscape plant specimens, determine recommendations for control of certain pests.
3. When given various landscape plant specimens with disease or insect damage, carry out recommended procedures for controlling specific plant pest problems.
4. Give a landscaped area, implement a preventative program for pest control.

AREA: ORNAMENTAL HORTICULTURE

Unit: Landscape Insect and Disease Control

(5-8)

* 1. The branch of study which specifically studies insects is known as:

A. polmology
B. bugology
C. biology
D. entomology

2. The hard covering of an insect which serves as a skeleton is called:

A. thorax
B. exoskeleton
C. epidermis
D. indoskeleton

3. The process of changing form which an insect goes through in its development is called:

A. maturation
B. pupaetion
C. metamorphosis
D. life cycle

4. Using the Vedalia lady beetle to control cottony-cushion scale on California citrus is an example of:

A. natural control
B. biological control
C. control by exclusion
D. cultural control

GO TO NEXT PAGE

5. The most common form of reproduction in fungi is:

A. through seeds
B. assexual
C. through spores
D. by metamorphosis

6. Types of fungi which obtain their food from living plants are called:

A. parasites
B. saprophytes
C. fungicides
D. scab

7. Damage which destroys or cuts through the cambium layer under the bark completely around a plant is called:

A. bridging
B. girdling
C. clorosis
D. pruning

8. If plant roots are found to be twisted and knotted, the organism very likely to have caused the damage is:

A. nematodes
B. virus
C. bacteria
D. fungi

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9. The study of plant diseases is called:

    A. plant pathology
    B. microbiology
    C. botany
    D. immunology

10. When leaves of pine, oak, maple, roses, azalea and other plants become yellow between veins from causes other than disease organisms, a common cause is:

    A. iron chlorosis (shortage of iron)
    B. an acid soil
    C. very hot weather
    D. shortage of soil moisture

11. The metamorphosis stage of insect development which is a motionless resting form is the:

    A. adult
    B. egg
    C. pupa
    D. larva

12. The grass hopper is an example of an insect which has three stages to its metamorphosis. Insects of this group hatch into young insects which look much like small adults, called:

    A. larva
    B. pupa
    C. nymphs
    D. nematodes

13. A chemical which is taken into a plant and spreads throughout the plant juices, killing insects which feed on the plant juices is called a:

    A. contact poison
    B. fumigant
    C. chemical sterilant
    D. systemic insecticide

GO TO NEXT PAGE

14. A type of insect poison which would be useful in killing insects which feed by sucking juices from plants, but which would have little affect on insects that move in after the poison is applied is a:

A. fumigant
B. sterilant
C. contact poison
D. systemic insecticide

15. The type of insecticide which may be used to treat male insects so that after mating, the female produces eggs that are not fertile, is called a:

A. systemic insecticide
B. chemical sterilant
C. attractant
D. repellant

16. Soil pasturization is done to:

A. kill weed seeds
B. kill disease organisms
C. kill insect eggs
D. all the above

17. Red spiders are controlled chemically by the use of:

A. herbicides
B. miticides
C. fungicides
D. antibiotics

18. The least important method of insect and disease control in the home landscape should be:

A. use of resistant varieties
B. removal of dead and diseased branches
C. keeping plants watered, fertilized, and vigorous
D. chemical applications

GO TO NEXT PAGE

19. Apple scab on crabapple trees is caused by:

    A. fungus
    B. virus
    C. bacteria
    D. germ

20. Gall formations on evergreen plants are:

    A. colonies of nitrogen fixing bacteria
    B. caused by the sting of insects as they feed
    C. egg cases of the gall fly
    D. the pupa stage of the gall worm

21. Of the three steps for controlling insects, which of the following shows the steps in the proper order?

    A. application, prescription, identification
    B. identification, application, prescription
    C. identification, prescription, application
    D. prescription, identification, application

22. Tree trunk girdling is a result of feeding by:

    A. mice
    B. rabbits
    C. deer
    D. all the above

23. Nematocides (chemicals used to control nematodes) are applied normally as:

    A. contact poisons
    B. fumigants
    C. attractants
    D. chemical sterilants

24. Mildew on lawns is caused by a:

    A. fungus
    B. bacteria
    C. rust
    D. scale

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25. Bark injuries to trees should be repaired by:

A. removing damaged bark and shaping the wound so that it is pointed at the top and bottom
B. removing loose bark and shaping the wound into a circle
C. painting the damaged area with an oil base paint
D. both B and C above

26. If you should accidentally spill some pesticide concentrate on yourself, you should immediately:

A. consult the label to see if an antidote is suggested
B. remove contaminated clothing and wash thoroughly
C. telephone a doctor for instructions
D. contact the local Poison Control Center

27. The first step in preparing to use a pesticide is to:

A. put on your rubber gloves and respirator
B. clean the sprey tank with hot soapy water
C. read the pesticide label
D. make sure the sprayer nozzles are not clogged

28. Pesticides should be stored:

A. in their original containers only
B. in a cool, dry place where they will not freeze
C. in a building or cabinet which is always locked
D. all the above

29. Empty pesticide containers should be:

A. sent to the local dump or incinerator
B. thoroughly cleaned and recycled
C. saved for future use
D. buried or burned away from people and animals

END OF TEST

TABLE: 5-8 A
AREA: Ornamental Horticulture
TEST NO.: 5-8
KUDER-RICHARDSON 20: .875
KUDER-RICHARDSON 21: .849

N(tests) = 24

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D	.375	.969	.668	71.4
2.	B	.167	.707	.499	28.6
3.	C	.208	.911	.505	57.1
4.	B	.667	.339	.129	21.4
5.	C	.375	.368	.208	23.8
6.	A	.333	.729	.473	40.5
7.	B	.333	.969	.559	71.4
8.	A	.458	.969	.592	71.4
9.	A	.292	.911	.641	57.1
10.	A	.292	.911	.403	57.1
11.	C	.583	.000	.702	100.0
12.	C	.625	.707	.434	35.7
13.	D	.333	.861	.559	54.8
14.	C	.375	.969	.682	71.4
15.	B	.250	.999	.722	85.7
16.	D	.083	.707	.385	28.6
17.	B	.417	.999	.696	85.7
18.	D	.542	.969	.439	71.4
19.	A	.500	.110	.007	7.1
20.	B	.708	.998	.667	83.3
21.	C	.125	.707	.421	28.6
22.	D	.583	.998	.661	83.3
23.	B	.792	.707	.210	35.7
24.	A	.333	.426	.201	26.2
25.	A	.500	.729	.277	40.5
26.	B	.167	.827	.444	42.9
27.	C	.167	.426	.426	26.2
28.	D	.292	.729	.507	40.5
29.	D	.250	.911	.597	57.1
30.					

AREA: ORNAMENTAL HORTICULTURE

Unit: Use and Characteristics of Flowers, Plants and Decorative Materials

Student Performance Objectives

The student should be able to:

1. When given various common cut flowers found in local floral businesses, identify each by name and give its identifying characteristics according to references cited in this unit.

2. When given foliage and flowering pot plants commonly found in local floral businesses, identify each by name and give its most common uses to the satisfaction of the instructor.

3. When given a variety of greens used for design work, identify each and give its common uses in design to the satisfaction of the employer or teacher.

4. When given decorative materials such as containers, ribbons, netting and holding devices, recognize each and determine how each is used in floral design to the satisfaction of the instructor or employer.

AREA: ORNAMENTAL HORTICULTURE

Unit: Use and Characteristics of Flowers
(5-9)

1. Which material is not a commonly used holding device in floral design?

   A. styrofoam
   B. chicken wire
   C. greens (foliage)
   D. sand

2. One of the most popular spike flowers used in floral design is:

   A. Chrysanthemum
   B. Gladiolus
   C. Babys Breath
   D. Aster

3. Which of the following flowers has the best keeping quality?

   A. Gardenia
   B. Hybrid Tea Rose
   C. Gladiolus
   D. Chrysanthemum

4. Which is most commonly used as a source of foliage for making flower arrangements?

   A. Maidenhair Fern
   B. English Ivy
   C. Boxwood
   D. Salal (Lemonleaf)

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5. One of the largest-selling pot plant which is used for its colorful effect in planters, window boxes and flower beds in the warmer months is the:

A. African Violet
B. Poinsettia
C. Azalea
D. Geranium

6. Poinsettias have been very popular as a Christmas plant and can be grown in the color(s):

A. red only
B. red, pink, and white
C. red and white
D. red, pink, and yellow

7. The "Sweetheart" Rose belongs to the class of Rose called Hybrid Teas.

A. true
B. false

8. Gardenias which have been wired and combined with foliage before being sold to retailers are termed:

A. tailored
B. regulars
C. primed
D. pre-set

9. The Spiral Eucalyptus would be used by the retail florist as:

A. foliage for flower arrangements
B. potted foliage plant
C. potted flower plant

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10. Antidesiccants or antitranspirants are used to:

    A. keep roots from drying out during shipping
    B. reduce moisture loss from leaves
    C. slow down respiration in storage tissue
    D. control scale insects

11. Which of the following flowers is shipped in a vial of water?

    A. Bird of Paradise
    B. Orchid
    C. Gardenias
    D. Roses

12. The broad class of cut flower Chrysanthemums which have branched stems resulting in a spray of smaller flowers are called:

    A. standards
    B. ~~pompons~~
    C. disbuds
    D. fujiis

13. Which foliage has the heaviest texture?

    A. Asparagus Fern
    B. Huckleberry
    C. Baker Fern (Leatherleaf Fern)
    D. Salal (Lemonleaf Fern)

14. Direct sunlight on African Violets during spring, summer or fall will:

    A. severely burn the leaves
    B. cause full bloom
    C. cause excessive leaf growth
    D. deepen the bloom color

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15. The colorful parts of Poinsettia are not true petals but are called:

A. tuber
B. pistil
C. spikes
D. bracts

16. Roses are generally very short lived as a cut flower, usually lasting only three or four days unless they are placed in water with a flower preservative.

A. true
B. false

17. The cut flower which is considered the mainstay of the funeral business is the:

A. Lily
B. Gladioli
C. Stocks
D. Gardenias

18. Which of the following would not be considered a holding device for floral arrangements:

A. asymmetrical triangle
B. florist's clay
C. brandy snifter
D. styrofoam

19. Which of the following cut flowers is relatively sensitive to temperature and should be stored at a temperature above 55 degrees fahrenheit?

A. Rose
B. Carnation
C. Chrysanthemum
D. Orchid

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20. A single stemmed Chrysanthemum which has a tubular petal form giving the flower a stringy appearance is called:

A. fujiis
B. disbud
C. standard
D. pompons

21. Which of the following greens has the poorest keeping quality when not used in water?

A. Huckleberry
B. Asparagus Fern
C. Baker Fern (Leatherleaf Fern)
D. Salal (Lemonleaf)

22. The blooms of the Easter Lily can be made to last longer if the pollen sacs are taken out before the pollen is shed.

A. true
B. false

23. Hydrangeas are noted for having three to six large ball-shaped flower heads and the plants have the characteristic of:

A. being very sensitive to dry soil
B. obtaining a maximum height of about two feet if planted outdoors
C. needed very little watering
D. being able to stand very cool climate

24. Sweetheart roses are smaller, have shorter stems and shorter life as a cut flower than the Hybrid Teas.

A. true
B. false

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25. The foliage type plant which has large, dark green leaves and a climbing or vine-like growth would be the:

A. Philodendron
B. Dracaena Sanderiana
C. Sansevieria
D. Boston Fern

26. A very delicate flower which has large velvety white petals which must be handled with extreme care because the petals turn brown when touched is:

A. Gardenias
B. Carnations
C. Chrysanthemum
D. Orchid

27, A disbud class of Chrysanthemum is one which has had the side buds removed to allow just one flower on the stem to develop.

A. true
B. false

28. Poinsettias are very sensitive to freezing, and must be carefully wrapped before leaving the flower shop in cold weather.

A. true
B. false

29. A plant that is closely related to the African Violet and has large, fleshy, hairy leaves, and large bell shaped flowers is the:

A. Wax Begonia
B. Hydrangea
C. Gloxinia
D. Poinsettia

30. Carnations which have one 2-1/2 inch bloom per stem are classed as:

A. minatures
B. sprays
C. regulars
D. pompons

GO TO NEXT PAGE

31. A plant that would not be used as greens by a retail florist:

A. Jade Palm
B. Asparagus Fern
C. "Huckleberry"
D. Orchid

32. Wax Begonias do best when planted outdoors if they are placed in a sunny location.

A. true
B. false

33. A corsage made by stringing the florets of Gladiola as one would string beads is called a:

A. Glamelia
B. Pompon
C. Fujiis
D. Nosegay

34. Cut Snapdragons have a good keeping quality but it is not desirable to have them shipped long distances because they bruise easily and the spike tips turn upward from the horizontal position.

A. true
B. false

END OF TEST

TABLE: 5-9 A
AREA: Ornamental Horticulture
TEST NO.: 5-9
KUDER-RICHARDSON 20: .696
KUDER-RICHARDSON 21: .650
N(tests)= 92

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D	.576	.324	.126	20.8
2.	B	.565	.965	.474	72.3
3.	D	.413	.729	.261	40.0
4.	D	.848	.353	.221	19.7
5.	D	.402	.951	.494	68.0
6.	B	.163	.790	.429	36.4
7.	B	.576	.454	.269	30.3
8.	A	.663	.818	.362	48.3
9.	A	.587	.383	.223	25.3
10.	B	.685	.770	.420	43.7
11.	B	.478	.718	.331	39.6
12.	B	.696	.324	.143	20.1
13.	D	.848	.649	.354	29.0
14.	A	.587	.661	.334	34.6
15.	D	.467	.965	.527	72.3
16.	A	.272	.279	.161	17.1
17.	B	.522	.965	.482	72.1
18.	A	.652	.853	.403	53.2
19.	D	.457	.924	.438	63.2
20.	A	.609	.397	.145	24.9
21.	C	.826	.110	.079	5.4
22.	A	.500	.707	.275	39.4
23.	A	.837	.110	.025	5.4
24.	B	.533	.047	.069	2.6
25.	A	.391	.898	.465	58.7
26.	A	.587	.718	.260	39.0
27.	A	.207	.696	.293	35.7
28.	A	.283	.383	.228	22.1
29.	C	.500	.884	.411	58.0
30.	C	.554	.760	.360	43.9

TABLE: 5-9 A
AREA: Ornamental Horticulture
TEST NO.: 5-9

Item	Correct Option	Relative Diffi- culty	Phi Coeff- icient	Point Biserial Coefficient	Discrim- ination Index
31.	D	.402	.836	.397	49.6
32.	B	.435	.383	.295	25.3
33.	A	.685	.187	.088	10.6
34.	A	.337	.696	.305	35.7
35.					
36.					
37.					
38.					
39.					
40.					
41.					
42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

AREA: ORNAMENTAL HORTICULTURE

Unit: Landscape Site Preparation

Student Performance Objectives

The student should be able to:

1. When given a specific site to be landscaped, use hand tools to grade and drain the site, according to the landscape plans and to the satisfaction of the instructor or employer.

2. When given a site to landscape, demonstrate the procedure(s) for collecting a representative soil sample, preparing it for analysis, and interpreting the results after analysis.

3. When given specific landscape plans, construct walls, patios, walks and/or other structures, according to recommended procedures and to the satisfaction of the instructor.

Unit: Landscape Site Preparation
(5-11)

1. Landscape plans are usually drawn so that the top of the plan would be in the direction of:

   A. west
   B. south
   C. north
   D. east

2. Placing the landscape plan so that the compass direction of the plan matches the actual direction of the landscape is called:

   A. site grading
   B. plan orientation
   C. scaling the plan
   D. plan contouring

3. Indicating what a given distance on a landscape plan would equal on the ground is called:

   A. scale
   B. map symbols
   C. map contour
   D. modification

4. Construction symbols for the walls of houses are shown as:

   A. double thin lines
   B. a dash line
   C. triple thin lines
   D. solid black lines

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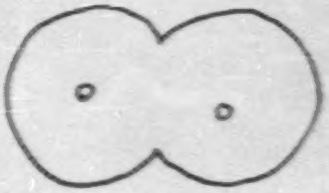
5. Lines on a landscape map which represent the same height of land are called:

A. contour lines
B. swale lines
C. scale lines
D. site grading

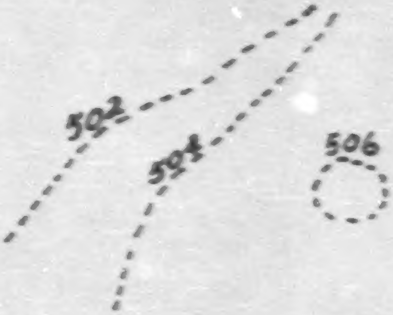
6. This blueprint symbol indicates:

A. contour lines
B. a contoured pool
C. two trees of the same variety
D. a hedge



7. This blueprint symbol indicates:

A. that a tree is to be planted 506' from a road
B. the location of level lines at the height indicated
C. the location of a knob 506' in circumference
D. the location of drainage lines



8. Drainage tile lines are usually placed:

A. 4-6 feet deep
B. with a 1/8 inch per foot slope
C. 2-3 feet apart
D. in sloping sandy soils

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9. Which of the following people designs, establishes, and maintains small landscape projects?

A. a grounds superintendent
B. the landscape nurseryman
C. the garden center manager
D. the landscape worker

10. Which of the following people work under the supervision of a foreman in establishing and maintaining landscapes:

A. the garden center salesman
B. the garden center worker
C. the landscape worker
D. the nursery salesman

11. When constructing a patio, ideally, the foundation should be made with a compacted sub-grade and:

A. a coarse aggregate and sand
B. coarse aggregate alone
C. sand alone
D. coarse concrete and sand

12. Both asphalt and concrete are used for hard surfacing driveways. Which of the following is true for asphalt?

A. the thickness of asphalt needed for driveways is more than the thickness of concrete needed for driveways
B. asphalt should not be used if floral or shrub plantings are close
C. asphalt does not need a porous base material
D. asphalt is crowned to promote drainage

13. Grading should be done in such a way that surface water will be carried away from the house in all directions by grading to a slope of:

A. 1" per hundred feet
B. 1' per hundred feet
C. ¼" to ½" per foot
D. 1" per foot

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14. If changes in grade raise the soil level around trees:

A. a dry well should be constructed around the tree
B. the tree adapts on its own to any changes in soil level
C. extra soil should be placed near the tree to increase water drainage away from it
D. tile lines should be installed around the tree

15. Stone retaining walls built without mortar are called:

A. patios
B. flagstones
C. dry walls
D. swales

16. One practice to determine whether additional sub surface drainage is needed is to dig a hole 18" deep with a post hole digger and fill it with water. If at the end of one hour the hole is 1/4 filled with water:

A. extra drainage is definitely needed
B. drainage is about average and the need for additional drainage is questionable
C. this is good drainage and further drainage would not be necessary

17. The major objectives(s) of landscape design is(are):

A. beauty
B. usefulness and beauty
C. economic value, usefulness
D. beauty, usefulness, economic value

18. When space is very limited, which of the following is the best screening material to use:

A. a deciduous hedge
B. hedge of columnar evergreens
C. a wooden fence
D. a row of trees

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19. When transplanting trees about 1/3 of the growth should be removed primarily to:

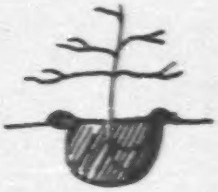
    A. develop a desirable shape
    B. compensate for roots lost
    C. reduce the transpiration from the leaves
    D. make the tree easier to handle

20. The land near a home may have a steep slope. The best solution for landscaping would be:

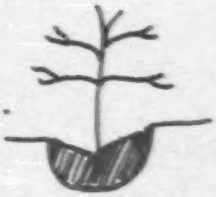
    A. plant the entire area with crownvetch
    B. terrace the slope
    C. build a rock garden
    D. build a retaining wall

21. When transplanting which of the following is the best soil placements:

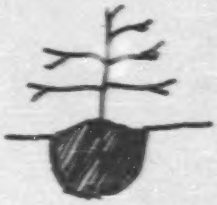
A.



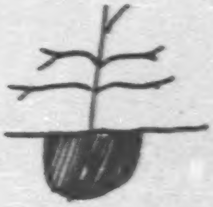
B.



C.



D.



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22. If a landscape plan uses a scale of ¼" = 1 foot, then an 18' wide driveway would be shown on the plan as:

    A. ¼'
    B. 4½"
    C. 9"
    D. 18"

23. When digging a hole for transplanting, the hole should be dug:

    A. the same size as the transplant root system
    B. 4-6" bigger than the transplant root system and then the extra size filled with loose soil
    C. about ½ again as big as the transplant root system
    D. the same size as the branch growth

24. When comparing turf establishment by sowing seed versus laying sod, the following would be generally true of establishment:

    A. seeding would be slower and less expensive
    B. sod laying would be slower and more expensive
    C. seeding would be faster but less expensive
    D. seeding would be faster but more expensive

END OF TEST

TABLE: 5-11 A
AREA: Ornamental Horticulture
TEST NO.: 5-11
KUDER-RICHARDSON 20: .286
KUDER-RICHARDSON 21: .075

N(tests) = 30

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.167	.729	.271	33.3
2.	B	.567	.898	.305	61.1
3.	A	.400	.898	.398	61.1
4.	D	.300	.809	.362	44.4
5.	A	.467	.809	.271	50.0
6.	C	.300	.809	.334	44.4
7.	B	.733	.750	.391	38.9
8.	A	.433	.941	.546	66.7
9.	B	.867	.637	.119	16.7
10.	C	.133	.279	.230	16.7
11.	D	.667	-.172	-.149	-11.1
12.	D	.767	.411	.183	22.2
13.	C	.800	.000	.020	00.0
14.	A	.433	.884	.360	55.6
15.	C	.667	.264	.130	16.7
16.	A	.833	.125	.047	5.6
17.	D	.233	.809	.440	44.4
18.	C	.767	-.110	.120	-5.6
19.	C	.933	-.339	-.289	-11.1
20.	B	.467	.898	.483	61.1
21.	A	.900	.00	.035	00.0
22.	B	.467	.637	.456	33.3
23.	B	.467	-.440	-.072	-27.8
24.	A	.500	.809	.369	50.0
25.					
26.					
27.					
28.					
29.					
30.					

AREA: ORNAMENTAL HORTICULTURE

Unit: Propagation by Cuttings

Student Performance Objectives

The student should be able to:

1. When given hardwood and softwood stem parts and a knife, prepare specimens for mist bed propagation, according to recognized criteria.

2. When given various nursery plants, demonstrate proficiency in leaf-bud, leaf, terminal bud and root cuttings as methods of propagation and prepare the cuttings for rootings

AREA: ORNAMENTAL HORTICULTURE

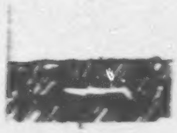
Unit: Propagation by Cuttings (5-13)

1. Some plants such as Black Raspberry, Camellias, and Rhodondendron can form roots but are not able to start buds from cuttings. A way to propagate plants like these is to use:

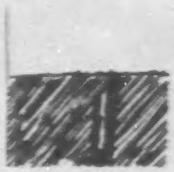
   A. leaf-bud cuttings
   B. leaf cuttings
   C. stem cuttings
   D. none of the above will work

2. When using root cuttings of fleshy roots for propagation, nurserymen have a standard manner for cutting roots for root cuttings to identify which end goes up and which goes down. The proper cut and position is:

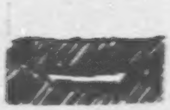
A.



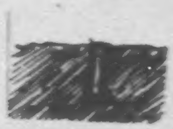
C.



B.



D.



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3. When propagating plants from leaf cuttings:

   A. the entire leaf of all plants should be covered by the medium
   B. lay the leaf on top of the medium so midrib or leaf margins are touching the medium
   C. stick the petiole of the leaf in the medium up to the leaf blade
   D. place all leaves vertically in the medium so the leaf is half in and half out of the medium

4. Roots which can be made to arise where roots would not ordinarily arise, such as on a stem cutting are called ________________ roots.

   A. basal
   B. root hairs
   C. tap
   D. adventitious

5. The best temperature range for bottom heat to get cuttings to root is:

   A. 32° - 40°F
   B. 40° - 54°F
   C. 55° - 67°F
   D. 68° - 72°F

6. Light cuts or wounds made by a knife near the basal part of a stem cutting:

   A. may greatly increase the area where roots will form on many cuttings
   B. is a good way to keep a root from forming a callus
   C. increases the chance of root rot and fertilizer burn
   D. is a sure sign of careless cutting techniques and should be avoided

7. The genetic characteristics of plants grown from cuttings:

   A. is different than the parent plant
   B. varies from plant to plant
   C. is the same as the parent plant
   D. is superior to that of the parent plant

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8. Hard wood stem cuttings of deciduous plants should be taken after the leaves have dropped in the fall but before too late in the winter in order that:

   A. the cutting does not develop top growth too fast for the root growth when stuck
   B. it can be held dormant at 30° - 40°F for at least 20 days before sticking
   C. the cutting is not frozen which would kill the buds
   D. the work load of the nursery workers is better balanced throughout the year

9. When selecting stem cuttings from deciduous hard wood plants the cuttings should include:

   A. only one leaf bud
   B. only wood from the past seasons growth
   C. at least some of two seasons growth
   D. both terminal cuts and cuts from terminal parts

10. Hard wood stem cuttings of such narrow leaved evergreens as Yew, Arborvitae, and Juniper should be taken:

    A. in fall or winter after plants have been exposed to freezing
    B. during active growth in the spring
    C. during warmest part of the summer
    D. any of the above are equally satisfactory

11. The procedure of placing stem cuttings into the propagation medium is referred to as:

    A. planting
    B. layering
    C. sticking
    D. grafting

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12. The types of stem cuttings which usually root quicker and easier are:

    A. soft wood cuttings
    B. hard wood cuttings

13. Usually the basal cut of soft wood stem cuttings should be made:

    A. about ½ inch below a node
    B. to include a minimum of two nodes
    C. with a slanting cut
    D. all three of the above

14. Soft wood stem cuttings should be taken from:

    A. stems at ground level
    B. terminal parts of the stems
    C. 2nd year growth
    D. evergreens only

15. Soft wood stem cuttings should be taken while the plants:

    A. are in active growth in late spring or early summer
    B. are dormant but not frozen
    C. are in a dormant and frozen condition
    D. only after the flowers have bloomed

16. Leaves of soft wood stem cuttings should be handled in the following manner:

    A. remove leaves from the basal 1/3 when basal cut is made
    B. leave all leaves on and bury the basal 1/3 when sticking
    C. remove all leaves before sticking to prevent excessive transpiration
    D. remove leaves from the basal 1/3 just prior to sticking

17. A good propagation medium for good rooting of stem cuttings is one that has:

    A. high moisture holding capacity and little or no air space
    B. mostly clay soil for adequate minerals and some peat for holding water
    C. a high level of nutrients added to a sand or peat base
    D. high moisture holding capacity and provides some air

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18. The proper time to apply rooting compounds to stem cuttings is:

    A. to apply solution around cutting after sticking
    B. immediately before sticking
    C. soak cuttings for 24 hours before sticking
    D. all of the above are equally satisfactory methods

19. Cuttings are portions of the ________ cut from mature plants.

    A. stems
    B. leaves
    C. roots
    D. all of the above

20. Cuttings are a means of:

    A. maintaining a true type of a plant
    B. producing large plants faster than from seeds
    C. produce plants having the desired sex
    D. all of the above

21. A good medium for propagating stem cuttings is:

    A. medium grade sand
    B. clay
    C. clay and manure
    D. all of the above

22. The use of rooting medium is especially beneficial to:

    A. induce roots to form on cuttings that would not otherwise eventually form roots
    B. take the place of good cultural practices
    C. speed rooting
    D. increase the number and size of roots
    E. C and D are correct

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23. Cuttings from rose rootstock would be an example of:

A. hard wood - deciduous cutting
B. soft wood cutting
C. herbaceous cutting
D. hard wood, narrow-leaved evergreen

24. The main purpose for maintaining high humidity for soft wood cuttings is that:

A. without it the cuttings may die because they do not have enough roots to replace moisture lost by the leaf transpiration
B. it tends to speed up the plant development of primordial cells and new roots
C. since the cutting does not have roots this method gets necessary moisture to the cells of the cutting
D. the cutting can more easily form a calber

25. When dealing with herbaceous plants such as the Geranium which "bleed" a milky sap, it is better to:

A. coat the cut end with a light wax coating before placing them in the rooting medium
B. let the cut end dry in the air a few hours before they are placed in the rooting medium
C. place the cut end immediately in the rooting medium before much bleeding takes place
D. pinch the cutting off, crushing the end rather than making a sharp cut

END OF TEST

TABLE: 5-13 A
AREA: Ornamental Horticulture
TEST NO.: 5-13
KUDER-RICHARDSON 20: .711
KUDER-RICHARDSON 21: .673

N(tests) = 192

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	A	.703	.110	.047	6.5
2.	D	.370	.661	.358	33.9
3.	B	.849	-.249	-.106	-11.2
4.	D	.615	.924	.530	64.0
5.	D	.557	.324	.160	20.9
6.	A	.641	.685	.360	36.3
7.	C	.464	.935	.506	66.0
8.	A	.766	.094	.068	4.5
9.	B	.792	.324	.224	18.3
10.	A	.615	.780	.368	44.9
11.	C	.547	.972	.634	74.4
12.	A	.198	.836	.442	44.9
13.	D	.453	.729	.321	40.5
14.	B	.385	.844	.447	52.5
15.	A	.563	.454	.286	29.6
16.	D	.703	.790	.402	44.5
17.	D	.458	.935	.526	65.8
18.	B	.453	.911	.519	61.1
19.	D	.318	.809	.444	46.2
20.	D	.479	.809	.405	48.9
21.	A	.531	.836	.427	51.8
22.	E	.526	.911	.517	62.2
23.	A	.578	.911	.515	62.2
24.	A	.609	.426	.262	27.8
25.	B	.849	-.172	-.064	-7.8
26.					
27.					
28.					
29.					
30.					

AREA: ORNAMENTAL HORTICULTURE

Unit: Selecting Turfgrasses for New Plantings

Student Performance Objectives

The student should be able to:

1. When given an established turf area, identify the turfgrasses growing in the area.

2. When given a list or group of available turfgrass varieties and the intended use of a particular turf area, such as golf greens and lawns, select the species or varieties that best meet the intended use of the area and will result in productive growth upon establishment.

3. When given a set of management practices for a turf area and available turfgrasses, select the most appropriate varieties for establishment that will withstand the management practices as well as be productive.

4. When given a set of environmental and soil conditions for a specific turf area, select the most appropriate species or mixtures of turfgrass(es) to use to meet the given conditions.

AREA: ORNAMENTAL HORTICULTURE

Unit: Selecting Turf Grasses
(5-15)

1. The surest means of maintaining genetic purity of perennial grasses is by:

   A. seeding
   B. vegetative reproduction
   C. sexual reproduction
   D. hand pollination

2. Selection of grasses for athletic fields and recreational parks should be done on the basis of their:

   A. ability to survive under heavy use and the nature of the play
   B. beauty and pleasing appearence
   C. resistance to disease
   D. speed of growth and reproduction

3. Which of the following statements would be the most accurate in selection of grasses?

   A. grass blends are always better than a single grass turf
   B. single grass turf is always better than a blend
   C. grass blends should have complimentary strong points
   D. blends do not provide any better insurance against the amount of disease, weed or cultural damage than single-grass turf

4. Some grasses are grown from pieces of horizontal stems of the plants called:

   A. rhyzomes
   B. brachts
   C. stolons
   D. laterals

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5. A primary reason for reproducing bentgrass by vegetative propagation rather than seeding is:

A. this plant does not produce seeds
B. it provides a means to maintain varietal purity
C. vegetative propagation is easier to do
D. a more even stand can be obtained

6. Characteristics which all grasses have but plants which belong to other plant families do not have is:

A. stems with solid joints and two-part leaves, one at each joint
B. stems with hollow joints and two-part leaves, one at each joint
C. stems with solid joints and one-part leaves, one at each joint
D. stems with hollow joints and one-part leaves, one at each joint

7. Which of the following would classify as a warm season or sub-tropical or warm season turf grass?

A. bluegrass
B. bentgrass
C. creeping red fescue
D. bermuda grass

8. The basic difference between a ground cover and a lawn is the requirement for:

A. fertilizer
B. mowing
C. watering
D. pest control

9. A plant which has become widely used as a ground cover for lawns in California, Arizona and other areas of the bermuda grass belt is not a grass but a soft, green, ground hugging, broad leafed plant called:

A. creeping red fescue
B. chewing fescue
C. dichondra (pony foot)
D. zoysia

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10. A feature which distinguishes the bluegrasses from most of the other turf grasses is that bluegrasses have:

    A. boat-shaped leaf tips
    B. long auricles
    C. fine textured leaves
    D. stolons for spreading in growth

11. A coarse-textured grass which would be selected for its wear tolerance and resistance to heat and drought would be:

    A. Kentucky bluegrass
    B. red fescue
    C. tall fescue
    D. bentgrass

12. A vigorous growing grass which is used for golf putting greens because of its ability to form a dense smooth surface under close mowing is:

    A. zoysiagrass
    B. bermuda grass
    C. red fescue
    D. creeping bentgrass

13. A grass which is fairly well adapted to cool, wet conditions, but is not good in shade, traffic or close mowing is:

    A. red fescue
    B. red top
    C. Kentucky bluegrass
    D. bentgrass

14. Which one of the following grass varieties would not be included in a mix for athletic fields because of the high level of maintenance required:

    A. Kentucky bluegrass
    B. merion Kentucky bluegrass
    C. bentgrass
    D. tall fescue

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15. Which grass is often included in lawn seed mixtures because it quickly provides a temporary ground cover?

A. annual bluegrass
B. Kentucky bluegrass
C. common ryegrass
D. creeping red fescue

16. A grass most suitable for shady conditions is:

A. Kentucky bluegrass
B. bentgrass
C. red fescue
D. rye

17. Which of the following would not be recommended as a grass for the cool-season grass region of the United States?

A. Kentucky bluegrass
B. creeping red fescue
C. creeping bentgrass
D. zoysia

18. Which of the following factors contributes the least to germination of seeds?

A. light
B. temperature
C. moisture
D. nitrogen level

19. The condition of a grass plant having small fine hairs is called.

A. glabrous
B. noxious
C. pubescence
D. inflorescence

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20. The stem on which the flowering parts of a grass plant are attached is known as the:

    A. auricle
    B. rachis
    C. node
    D. inflorescent

21. The bristle or beard like part which sticks out from the seed head of some grass plants is known as the:

    A. awn
    B. pubescent
    C. bract
    D. spike

22. The joint of a stem where the leaves or other plant parts originate are called:

    A. petioles
    B. rachis
    C. sheath
    D. nodes

23. The root systems of turf grasses are always characterized as:

    A. fibrous
    B. having rhizomes
    C. having nodules
    D. having stolons

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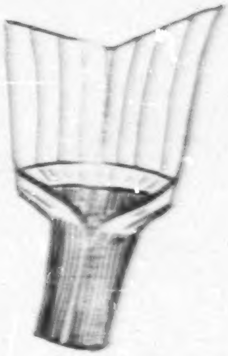
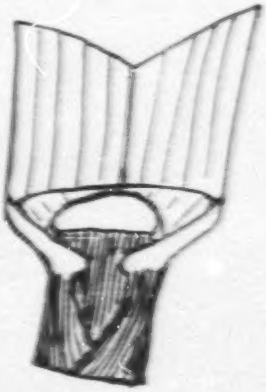


24. The above illustration shows the detail of a grass plant at the junction of the blade with the sheath. Which best describes this plant:

A. ligule absent
B. notched ligule margin
C. rounded auricles
D. overlapping sheath



25. The above illustration shows a plant which has:

A. ligule absent
B. rounded auricles
C. auricles absent
D. ligule with rough margin

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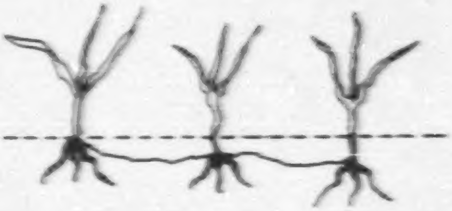
26. Identify the method of vegetative reproduction pictured below:

A. tillers
B. stolons
C. rhizomes
D. ligules



END OF TEST

TABLE: 5-15 A
AREA: Ornamental Horticulture
TEST NO.: 5-15
KUDER-RICHARDSON 20: .622
KUDER-RICHARDSON 21: .549

N(tests) = 40

Item	Correct Option	Relative Diffi- culty	Phi Coeff- icient	Point Biserial Coefficient	Discrim- ination Index
1.	B	.750	.972	.646	72.7
2.	A	.350	.279	.197	17.2
3.	C	.575	.770	.345	43.4
4.	C	.750	.685	.291	34.3
5.	B	.750	-.118	.089	-6.1
6.	A	.850	.770	.457	36.4
7.	D	.450	.818	.367	50.5
8.	B	.375	.990	.485	79.8
9.	A	.475	---	.603	88.9
10.	C	.750	.685	.291	34.3
11.	D	.775	.891	.534	54.5
12.	B	.800	.770	.289	36.4
13.	C	.875	.156	.102	7.1
14.	C	.625	.016	-.002	1.0
15.	C	.850	.696	.294	27.3
16.	D	.475	.809	.428	48.5
17.	D	.525	.818	.363	50.5
18.	C	.500	.898	.475	59.6
19.	B	.950	.000	-.086	00.0
20.	A	.925	-.685	-.245	-22.2
21.	D	.750	.770	.325	36.4
22.	A	.375	.898	.364	57.6
23.	A	.850	.309	.294	16.2
24.	B	.775	.233	.219	14.1
25.	C	.600	.729	.337	41.4
26.					
27.					
28.					
29.					
30.					

AREA: AGRICULTURAL RESOURCES

Unit: Fish Management in Lakes, Ponds and Streams

Student Performance Objectives

The student should be able to:

1. When given a specified water impoundment or waterway in his area, identify the major fish species that are found there.

2. When given a specified waterway or water impoundment, determine the following chemical properties of the water with the specified level of accuracy:

   A. Dissolved oxygen - within ± 2 parts per million
   B. Ph - within ± Ph level
   C. Water pollutants (natural and man-made) - within the standards for the particular test kit

3. When given a specified water impoundment or waterway, determine the following physical characteristics of the water with the specified level of accuracy:

   A. Water temperature at different depths - within ± 3° fahrenheit
   B. Turbidity of the water - to the satisfaction of the instructor
   C. Fertility of the water - within one unit on the measuring instrument
   D. Presence of algae and/or waterweeds

4. By observing the relative numbers and sizes of the different fish species in a water impoundment or waterway, determine the balance of the fish population with accuracy needed to develop specific management recommendations.

5. Using the data obtained through a chemical and physical analysis of the water and an analysis of the fish population present, describe the steps that should be taken to correct any fish imbalance that is present in the water impoundment or waterway.

6. Using the data obtained through a chemical and physical analysis of the water and an analysis of any fish populations present, select and implement a stocking program which would include species, size, and method of stocking to be used.

7. Using fish balance, stocking information, and any other pertinent information, develop a fish harvest schedule for a water impoundment or waterway which will promote healthy, vigorous fish and good fishing.

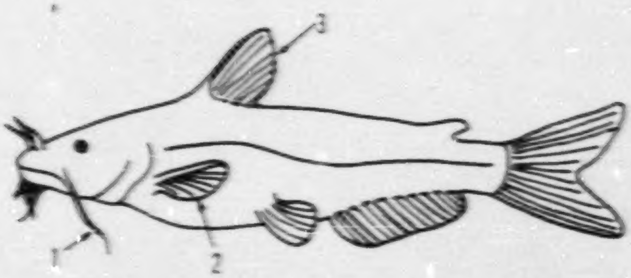
8. For a given water impoundment or waterway, recommend watershed management procedures which should be implemented to control excessive sedimentation and water pollution.

9. Upon identifying the species of weeds or algae in a water impoundment, select and implement a control program which will eliminate the problem and help prevent future problems.

10. Where economically feasible, fertilize a water impoundment using recommended rates and analyses so that fish production will be enhanced.

AREA: AGRICULTURAL RESOURCES

Unit: Fish Management in Lakes, Ponds and Streams (6-2)



1. In the above drawing, number 2 is called the:

   A. Caudal Fin
   B. Dorsal Fin
   C. Adipose Fin
   D. Pectoral Fin

2. In the same drawing, number 1 is called a:

   A. Finlet
   B. Maxilla
   C. Barbel
   D. Mandible

3. Due to differences in water samples taken at different times, temperature and weather conditions:

   A. samples should be taken only from the center of the water impoundment
   B. these conditions should always be noted with the sample
   C. samples should be taken at varying times so as to be representative
   D. both A and B are correct

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4. Water fertility can be determined by:

A. using a Secchi Disc
B. measuring the depth to which a bright object can be seen
C. the presence of water weeds
D. both A and B are correct

5. To obtain an indication of the fish balance in a pond:

A. only the shallow areas of the pond need seined
B. the entire pond should be completely seined
C. a seine with 1 inch or larger mesh should be used
D. both B and C are correct

6. Fish species such as Crappies and Bullheads:

A. should only be stocked in ponds in combination with a predator fish species
B. should not be stocked in ponds
C. should be stocked in ponds alone but not in combination with each other
D. should be stocked only if light fishing pressure is expected

7. Fishing for Bass and Bluegill in a stocked pond should begin:

A. within 2 months after stocking
B. after both species have spawned
C. after the bass have reached 12" in length
D. three years after stocking

8. The most desirable plants in a water impoundment are:

A. Algae
B. Phytoplankton
C. Cattails
D. Pondweed

9. A fertilization program to increase fish production in a water impoundment:

A. should not be discontinued once it has been started
B. often has unpredictable results in many parts of the country
C. will help prevent plankton algae blooms
D. both A and B are correct

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10. A Bluegill Sunfish is an example of a:

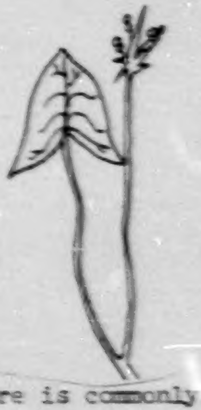
A. pan fish
B. game fish
C. bait fish
D. trash fish

11 The symbol Mg/l stands for:

A. milligrains per liter
B. milligrams per liter
C. grams of Magnesium per liter
D. micrograms per liter

12. Water temperature measurements:

A can be made using a mercury-filled or dial type centigrade thermometer, or a thermistor
B. should be made with instruments that have been checked for accuracy with a National Bureau of Standards certified thermometer
C. usually lack precision
D. all of the above



13. The water weed shown here is commonly called:

A. Pickerel Weed
B. Yellow Lilly
C. Arrowhead
D. Duckweed

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14. Land in the watershed of a water impoundment should be:

    A. restricted from grazing
    B. seeded to grasses and legumes
    C. cropped only if appropriate soil conservation practices are used
    D. planted in conifers

15. Biological control of undesirable pond weeds would include:

    A. using ducks or geese
    B. maintaining high water fertility levels
    C. pulling the weeds out by hand
    D. both A and B are correct

16. Over-fertility in water impoundments:

    A. is generally impossible to cause
    B. will often cause a fish kill
    C. exists if a bright object is blurred 18" from the waters' surface
    D. both B and C are correct

17. The Large Mouth Bass:

    A. has an upper jaw which extends to the eye but not beyond
    B. has a deep dorsal fin notch
    C. has an upper jaw which extends beyond the eye
    D. both B and C are correct

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18. 86° fahrenheit would be:

A. 22° centigrade
B. 26° centigrade
C 30° centigrade
D. 34° centigrade

19. Upon seining a Bass-Bluegill pond to determine fish balance:

A. the ratio of keeper-size Bass to Bluegill present should be recorded
B. the relative size of the Bass and Bluegill present should be recorded
C. the population of Tadpoles should be observed
D both B and C are correct

20. Channel Catfish:

A. may be stocked alone or with Bass and Bluegills
B. spawn in ponds prolifically
C are not recommended for stocking in ponds
D. both B and C are correct

21. Mechanical control of undesirable pond weeds would include:

A. increasing water depth in the shallow areas of the impoundment
B. introducing fish species which feed on the undesirable pond weeds
C. applying Copper Sulfate
D. adding fertilizer to the pond

22. A pH of 8.2 would be considered:

A. strongly acidic
B. weakly acidic
C. alkaline
D. neutral

23. Good pond fertility would be indicated by a plankton bloom which causes a bright object to be blurred at a depth of:

A. four-six inches
B. seven-twelve inches
C. fifteen-eighteen inches
D. none of the above

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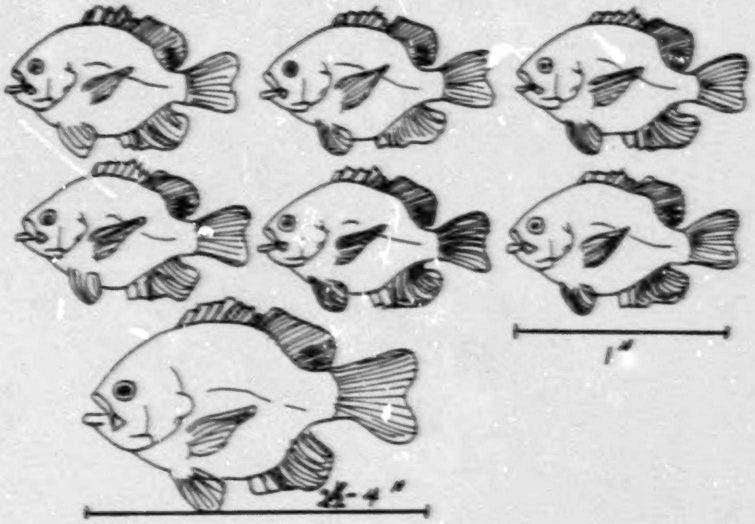
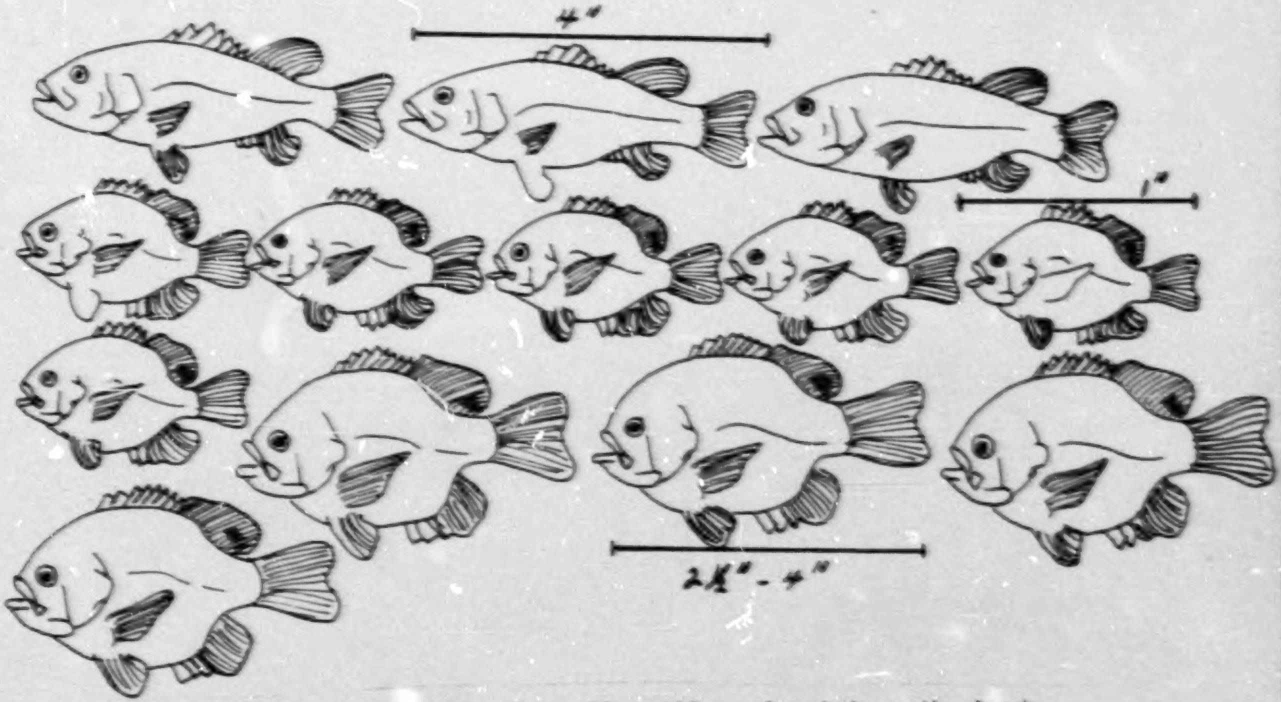


24. The above diagram indicates the results of a partial seining of a Bass-Bluegill pond. The best recommendation would be:

A. do not attempt to change the fish population
B. remove a large number of Bluegills
C. remove a large number of Bass
D. introduce a predator fish species to the pond



25. From the above diagram of a Bass-Bluegill pond seining, the best recommendation would be:

A. fish the pond hard
B. add Bluegill at the first opportunity
C. add Fingerling Bass at the first opporunnity
D. limit fishing severely

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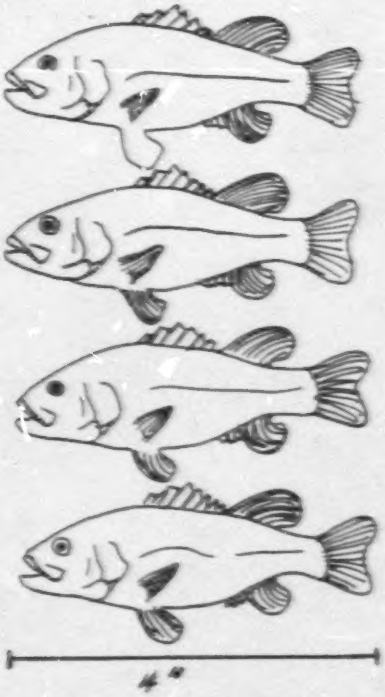

26. From the above diagram of a Bass-Bluegill pond seining, the best recommendation would be:

A. check the physical and chemical condition of the water
B. add Bluegills if water is suitable
C. fish hard for Bass
D. both A and B are correct

27 Which of the following is not a recommended method of reducing fish populations?

A. destroying nests
B. poisoning with Rotenone
C. using fish traps
D. poisoning with Dalapon

28. The most crucial water properties which must be maintained while transporting and stocking fish are:

A. temperature and turbidity
B. oxygen and turbidity
C. temperature and oxygen
D. oxygen and pH level

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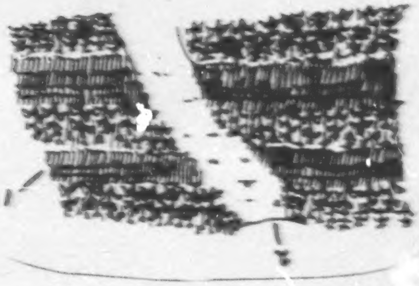

29. In the above diagram, the soil conservation practice indicated by number 2 is called a:

    A. diversion ditch
    B. drainage ditch
    C. contour strip
    D. sod waterway

30. A water sample that is made up by combining portions of samples taken on regular intervals throughout a sampling period is best described as a:

    A. selective sample
    B. proportionate sample
    C. fixed sample
    D. composite sample

31. To preserve water samples between sampling and analysis:

    A. sodium propionate should be added
    B. the sample should be kept at room temperature (72° F)
    C. sodium sulfonate should be added
    D. the sample should be refrigerated at less than 10° C

32. When sampling the water in flowing streams or rivers, the most accurate method is to:

    A. take the sample from the same location along the bank each time
    B. take the sample from the center of the stream or river
    C. take samples of cross-sections of the stream or river
    D. take samples in a zig-zag pattern

33. The appropriate volume of water to be taken in a sample:

    A. is determined by the laboratory tests being made
    B. should include enough to allow for a retest of the sample
    C. should be at least one liter
    D. both A and B are correct

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34. Water samples that are to be used for dissolved oxygen determination:

A. should be preserved by refrigeration at 10° C
B. should be tested on site
C. can be preserved using sodium thiosulfate
D. can be preserved using copper sulfate

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TABLE: 6-2'S
AREA: Agricultural Resources
TEST NO.: 6-2
KUDER-RICHARDSON 20: .427
KUDER-RICHARDSON 21: .375

N(tests) = 124

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D	.677	.454	.262	29.6
2.	C	.452	.637	.275	33.2
3.	B	.710	.156	.151	9.3
4.	D	.710	.187	.126	11.4
5.	A	.944	-.279	-.097	-8.9
6.	B	.782	.047	.058	2.1
7.	B	.677	.383	.138	22.9
8.	B	.629	.637	.288	32.1
9.	D	.645	.411	.290	26.8
10.	A	.460	.707	.326	38.6
11.	B	.395	.454	.296	29.6
12.	D	.677	.094	.089	6.1
13.	C	.323	.740	.356	38.9
14.	C	.685	.203	.069	12.1
15.	D	.500	.625	.282	31.8
16.	B	.694	.413	.260	28.2
17.	D	.613	.172	.106	11.1
18.	C	.782	.218	.175	12.5
19.	D	.815	.187	.120	8.6
20.	A	.790	.413	.217	24.3
21.	A	.815	.172	.090	8.2
22.	C	.750	.397	.216	23.2
23.	C	.597	.125	.129	7.5
24.	A	.669	.649	.319	32.5
25.	A	.605	.673	.229	35.0
26.	D	.516	.780	.365	46.4
27.	D	.734	.368	.275	20.7
28.	C	.444	.905	.476	60.7
29.	D	.621	.309	.206	19.3
30.	D	.710	.440	.212	25.7

TABLE: 6-2 S
AREA: Agricultural Resources
TEST NO.: 6-2

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
31.	D	.774	.454	.190	26.1
32.	C	.734	.324	.181	18.2
33.	D	.597	.740	.397	40.7
34.	B	.524	.673	.305	36.4
35.					
36.					
37.					
38.					
39.					
40.					
41.					
42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

AREA: AGRICULTURAL RESOURCES

Unit: Tree Identification

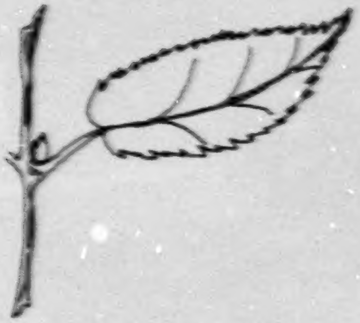
Student Performance Objectives

The student should be able to:

1. When given a group of economically important trees common to the area, correctly identify each by scientific and/or common name with the aid of references or an identification key.

AREA: AGRICULTURAL RESOURCES

Unit: Tree Identification (6-3)



1. In the diagram of the leaf, the margin would be described as:

   A. serrate
   B. undulate
   C. entire
   D. crenate

2. A leaf with no hairs present on it would be described as:

   A. silky
   B. villous
   C. pubescent
   D. glabrous

3. The place on a twig from which a bud originates is called the:

   A. bud scale
   B. node
   C. vascular bundle
   D. stipule

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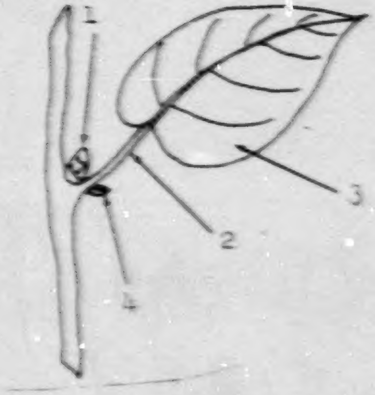
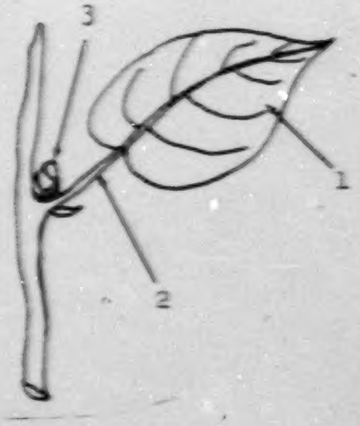


4. The leaf in the above diagram would be described as being:

A. whorled
B. pubescent
C. obtuse
D. simple

5. In the above diagram, no. 2 refers to the:

A. stem
B. petiole
C. peduncle
D. lamina



6. The leaf part indicated by no. 1 in the above diagram is called the

A. lamina or blade
B. [illegible]
C. [illegible]
D. [illegible]

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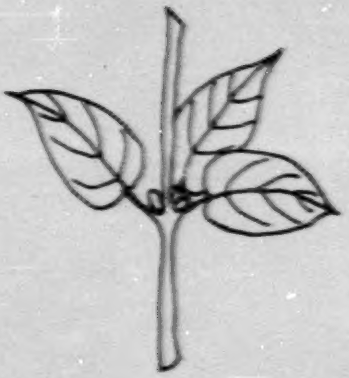
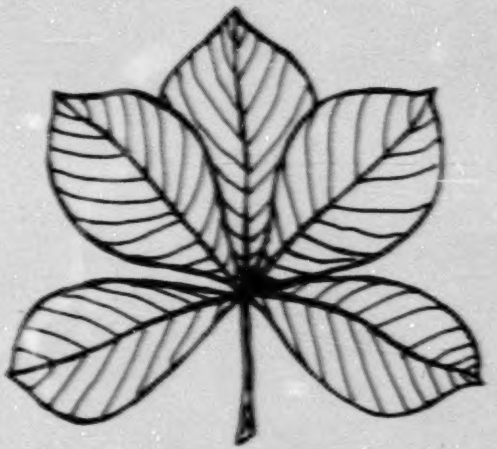


7. The above leaf arrangement is described as:

A. alternate
B. opposite
C. circular
D. whorled



8. The leaf diagrammed above would be described as a:

A. pinnately compound leaf
B. bi-pinnately compound leaf
C. palmately compound leaf
D. simple leaf

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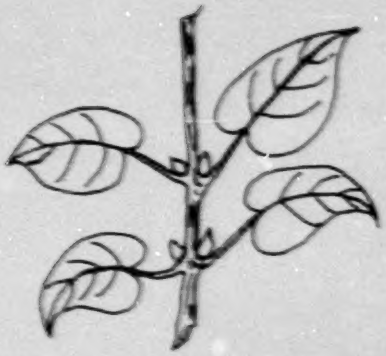
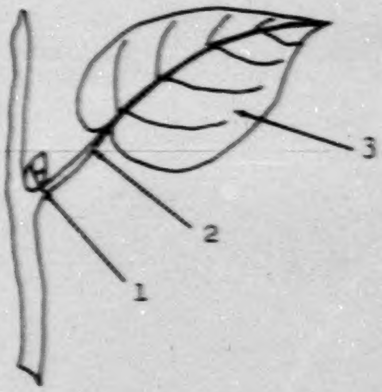


9 The above diagram represents a(n):

A. alternate leaf arrangement
B. whorled leaf arrangement
C. opposite leaf arrangement
D. double leaf arrangement



10. In the above diagram, No. 1 is called a(n):

A. lateral bud
B. axillary bud
C. accessory bud
D. both A and B are correct

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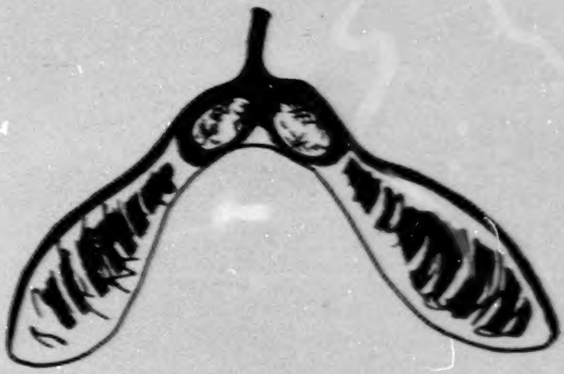

11. The above diagram is of a tree fruit called a(n):

A. drupe
B berry
C samara
D. nut

12. A tree that loses its leaves during the winter is described as being:

A. glabrous
B. stomatic
C. diecious
D. deciduous

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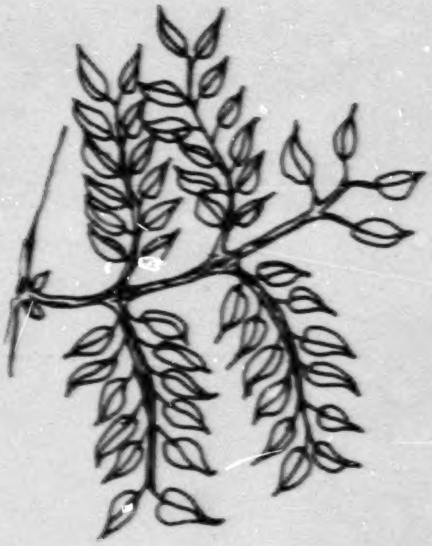
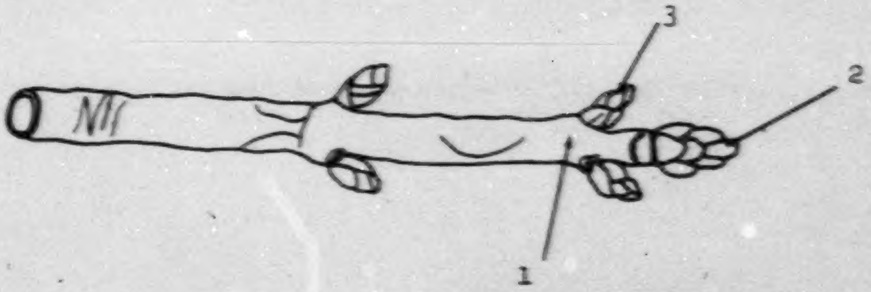


13. In the above diagram, the number of leaves present is:

A. 1
B 5
C. 8
D. 52



14. In the above diagram, No. 3 is a:

A. terminal bud
B. internode
C. lateral bud
D. lenticel

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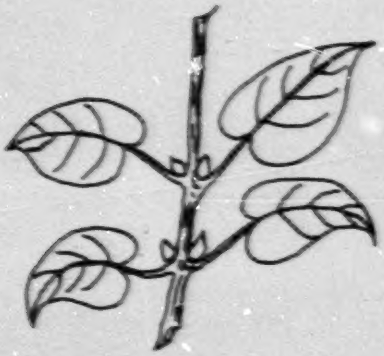
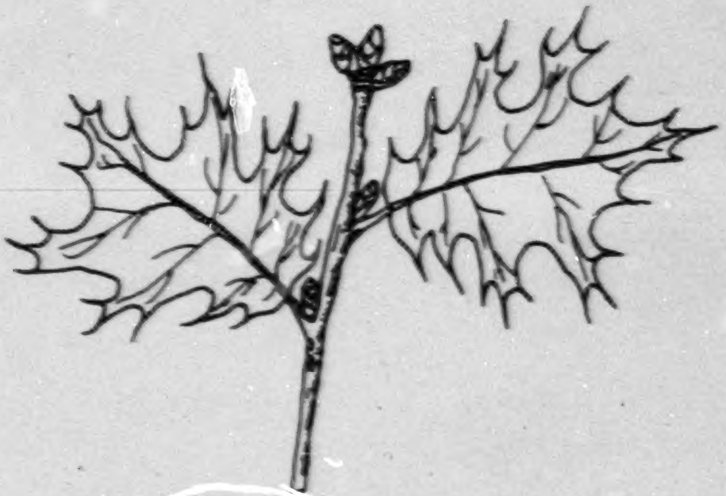


15. From the Tree Key that was given to you, the name of the tree in the above diagram is:

A. buckeye
B. maple
C. osage orange
D. dogwood



16 From the Tree Key, the name of the tree in the diagram above is:

A. catalpa
B. maple
C. sycamore
D. red oak

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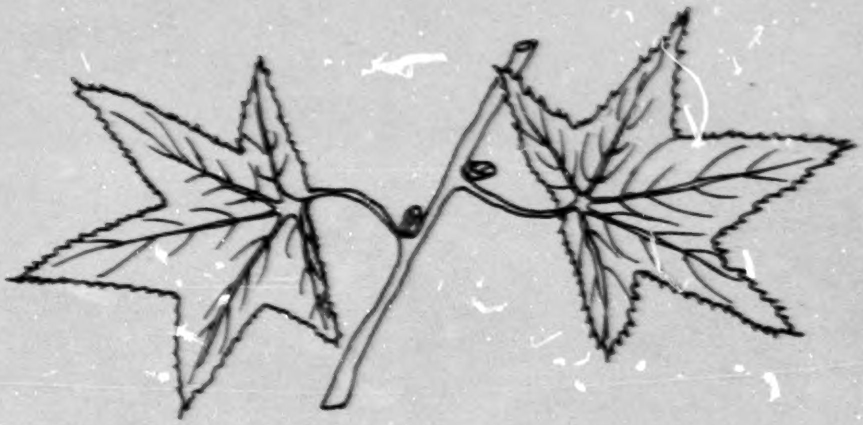
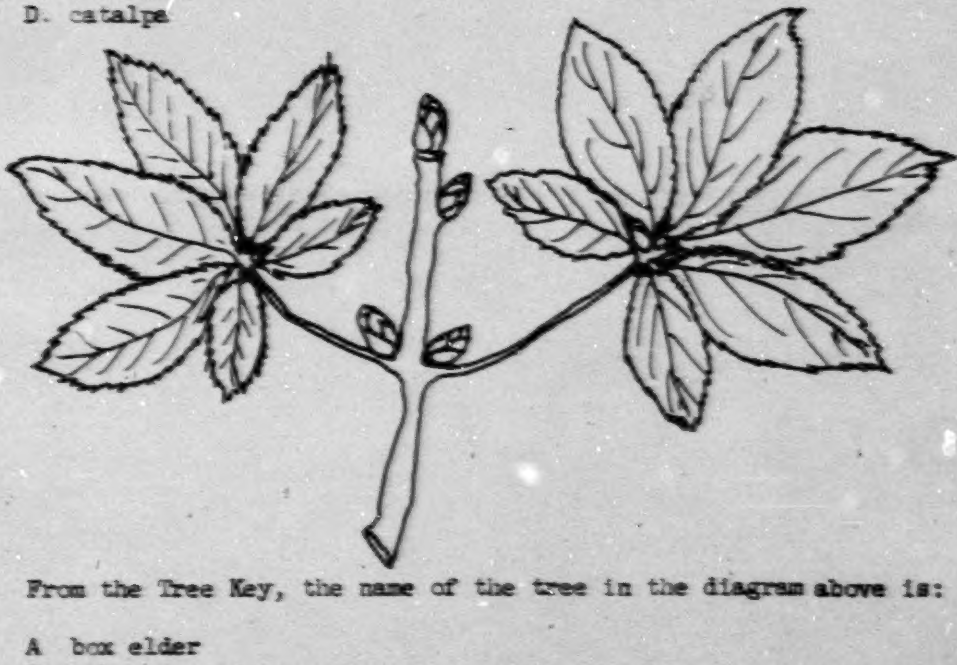


17. From the Tree Key, the name of the tree in the diagram above is:

A. white oak
B. sassafras
C. sweetgum
D. catalpa



18. From the Tree Key, the name of the tree in the diagram above is:

A box elder
B ash
C. mulberry
D buckeye

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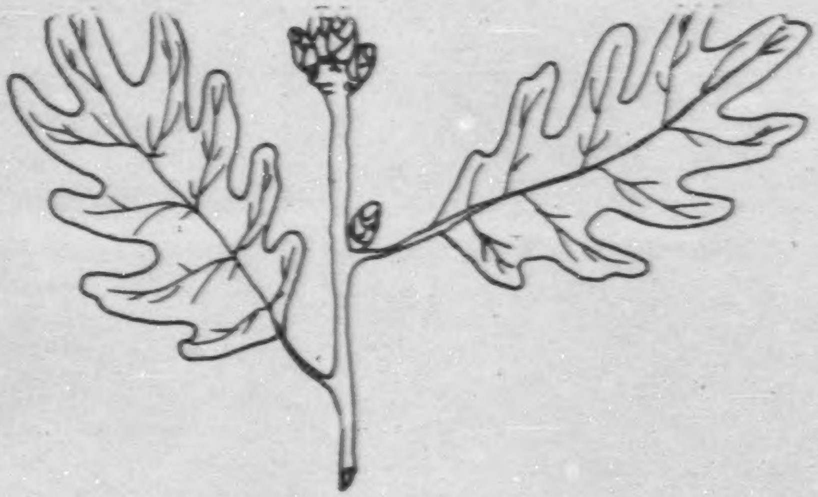
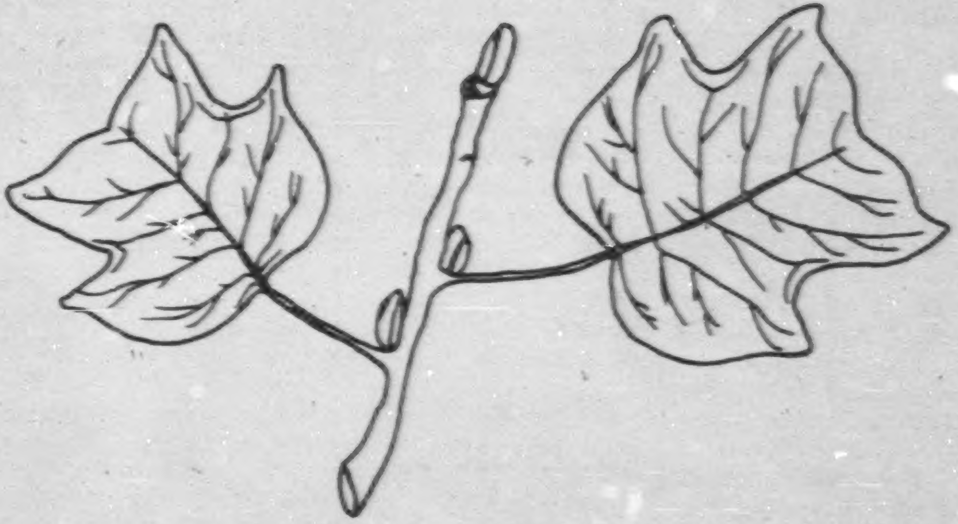


19 Using the Tree Key, the name of the tree in the diagram above is:

A. maple
B. white oak
C. hawthorne
D. sassafras



20. Using the Tree Key, the name of the tree in the diagram above is:

A. mulberry
B. sweet gum
C maple
D. tulip tree (yellow poplar)

END OF TEST

KEY TO SOME COMMON TREES AND SHRUBS

1. Leaves broad---------------------------------------2
1. Leaves needle-like to scale-like-----------------44
    2. Leaves opposite or whorled------------------3
    2. Leaves alternate---------------------------10
3. Leaves in whorls of 3-------------------------Catalpa
3. Leaves opposite---------------------------------4
    4. Leaves simple-------------------------------5
    4. Leaves compound ----------------------------7
5. Leaf margins entire--------------------------Dogwood
5 Leaf margins serrate or toothed------------------6
    6. Bud scales 3 or more, overlapping-----------Maples
    6. Bud scales 2 or not overlapping or absent----Arrow wood, Black haw
7. Leaves pinnately compound------------------------8
7. Leaves palmately compound------------------------9
    8. Leaflets 3-7, often lobed, previous year's twigs green----Box elder
    8. Leaflets, 5-13, not lobed, previous year's twigs gray----Ash
9. Leaflets usually 5, rarely 6-7------------------Buckeye
9. Leaflets usually 7-9, rarely 5-----------------Horse Chestnut
    10. Leaves simple-----------------------------11
    10. Leaves compound---------------------------39
11. Stems with thorns------------------------------12
11. Stems without thorns---------------------------13
    12. Leaves entire, never lobed----------------Osage orange
    12. Leaves serrate, sometimes lobed-----------Hawthorne and Crab apple
13. Three to 5 buds clustered at end of twigs-------14
13. Buds not clustered at end of twigs, never more than 2----15
    14. Tip of leaves or tip of lobes bearing bristles----Red oak group
    14. Tip of leaves or tip of lobes without bristles----White oak group
15. Leaves lobed or lobed and non-lobed on same tree----16
15. All leaves non-lobed----------------------------20
    16. Leaf margins entire-------------------------17
    16. Leaf margins serrate or toothed-------------18
17. Buds rounded, previous year's twigs green; leaves lobed and non-lobed on same tree----Sassafra
17. Buds flat, previous year's twigs brown; leaves always lobed----Tuliptree (Yellow poplar)
    18. Leaves non-lobed, 2-lobed and 3-lobed on same tree upper leaf surface usually rough----Mulberry
    18. Leaves 3 or 5 lobed, never non-lobed, upper leaf surface smooth----19
19. Leaves with 3 large veins at base (palmately veined) margins toothed----Sycamor
19. Leaves with 5 large veins at base (palmately veined) margins serrate----Sweet gu
    20. Leaf margins entire or with 1-3 large teeth----21
    20. Leaf margins serrate, crenate or with 5 or more teeth----24
21. Leaf base heart-shaped-------------------------Redbu

TABLE: 6-3 S
AREA: Agricultural Resources
TEST NO.: 6-3
KUDER-RICHARDSON 20: .613
KUDER-RICHARDSON 21: .551

N(tests) = 40

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	A	.500	----	.750	92.3
2.	D	.825	-.309	-.106	-14.7
3.	B	.750	.836	.442	41.7
4.	D	.400	.951	.577	68.6
5.	B	700	.426	.266	26.9
6.	A	.550	.979	.642	76.3
7.	D	.800	-.125	-.148	- 6.4
8.	C	.550	.426	.359	27.6
9.	C	.600	.760	.284	44.2
10.	D	.650	.187	.126	11.5
11.	C	.450	.898	.520	60.3
12.	D	.350	.935	.562	61.5
13.	A	.950	-.426	-.355	-15.4
14.	C	.525	.760	.429	43.6
15.	D	.575	.836	.400	51.9
16.	D	.450	.780	.316	44.9
17.	C	.325	.861	.514	53.2
18.	D	.800	-.661	-.226	-23.1
19.	B	.375	.426	.335	28.2
20.	D	.425	.979	.611	75.6
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

TABLE: 6-3 A
AREA: Agricultural Resources
TEST NO.: 6-3
KUDER-RICHARDSON 20: .501
KUDER-RICHARDSON 21: .422
N(tests) = 28

Item	Correct Option	Relative Diffi- culty	Phi Coeff- icient	Point Biserial Coefficient	Discrim- ination Index
1.	A	.286	.853	.390	51.4
2.	D	.714	.383	.134	20.8
3.	B	.750	.383	.280	20.8
4.	D	.571	.770	.359	43.1
5.	B	.821	-.047	.115	-2.8
6.	A	.750	.203	.108	9.7
7.	D	.571	.930	.585	65.3
8.	C	.714	.836	.354	44.4
9.	C	.500	.094	.187	5.6
10.	D	.714	.141	-.031	8.3
11.	C	.679	.661	.265	31.9
12.	D	.500	.979	.585	76.4
13.	A	.679	.905	.532	55.6
14.	C	.679	.661	.265	31.9
15.	D	.357	.853	.543	51.4
16.	D	.393	.264	.301	16.7
17.	C	.357	.440	.180	27.8
18.	D	.536	.770	.384	43.1
19.	B	.286	.413	.169	26.4
20.	D	.250	.707	.381	25.0
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

AREA: AGRICULTURAL RESOURCES

Unit: Forest Mensuration

Student Performance Objectives

The student should be able to:

1. Use one or more of the following measures of forest products to determine the volume of wood in a specified number of logs or bolts with accuracy required of a forestry aide:

   A. linear measurement
   B. cordwood measurement
   C. cubic foot measurement
   D. board foot
   E. weight

2. Using common tree measurement instruments and tree volume tables, determine the volume of timber in a standing tree within ± 3%.

3. Using tree identification keys and an increment borer or increment hammer, determine the species, age and/or history of a standing tree with accuracy required of a forestry aide.

4. When given commonly used surveying instruments, locate and establish forest boundaries and sample plots with accuracy needed to perform a timber cruise.

5. Identify and implement the different methods of cruising timber with competence required of a forestry aide.

6. Using state or regional price date, estimate the value of a given stand of timber within ± 10%.

7. Using a sprayer or brush and bucket, mark trees for harvesting using marking techniques accepted in the state or region.

AREA: AGRICULTURAL RESOURCES

Unit: Forest Mensuration
(6-4)

1. When determining the volume of a tree in cubic feet using a cubic foot volume table, the following measurements are needed:

A. the diameter breast height (DBH) and number of logs in the tree
B. the circumference breast height and the height of the tree in feet
C. the diameter breast height (DBH) and the height of the tree in feet
D. the diameter breast height (DBH) and the circumference of the tree

2. The number of board feet in a board can be determined using the following formula:

A. $\frac{\text{width in inches} \times \text{length in feet}}{\text{thickness in inches}}$
B. $\frac{\text{thickness in inches} \times \text{length in feet}}{\text{width in inches}}$
C. $\frac{\text{thickness in inches} \times \text{width in inches} \times \text{length in feet}}{144}$
D. $\frac{\text{thickness in inches} \times \text{width in inches} \times \text{length in feet}}{12}$

3. The merritt hypsomether would be most useful in determining:

A. the number of merchantable 16' logs in a standing tree
B. the total height of a standing tree in feet
C. the diameter breast height of a tree
D. both A and B are correct

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TREE SCALE

International 1/4 Inch Log Rule

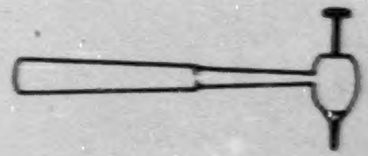
dia. 4'-6" above ground inches	Number of 16 Foot in Tree							
	½	1	1½	2	2½	3	3-1/3	4
	Contents in Board Feet							
12	30	60	80	100	120			
14	40	80	110	140	160	180		
16	60	100	150	180	210	250	280	310
18	70	140	190	240	280	320	360	400
20	90	170	240	300	350	400	450	500
22	110	210	290	360	430	490	560	610
24	130	250	350	430	510	590	660	740

4. From the above table, a standing tree with a 22" DBH and 2½ usable logs would contain approximately:

A. 350 Bd. Ft.
B. 490 Bd. Ft.
C. 290 Bd. Ft.
D. 430 Bd. Ft.

5. The forestry tool in the diagram is called a(n):

A. bark gauge
B. bark hammer
C. increment hammer
D. hand tree marker



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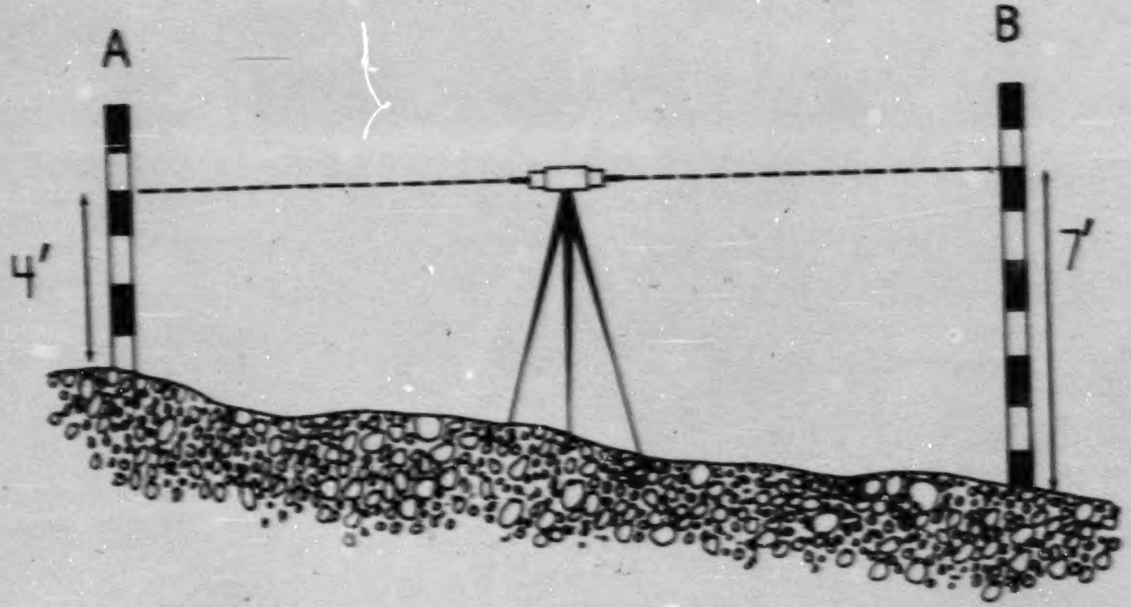
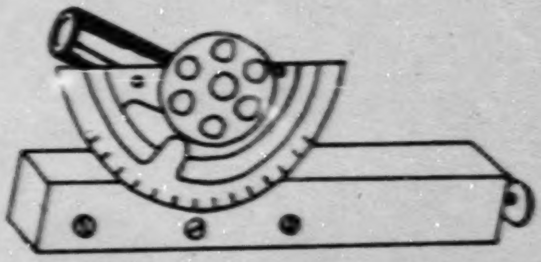


6. If rod A is setting on a benchmark that reads 890 feet above sea level, the altitude of B is:

A. 887 feet
B. 879 feet
C. 901 feet
D. 893 feet



7. The instrument in the above diagram used to measure angles of elevation or depression is called a(n):

A. dumpy level
B. altimeter
C. abney hand level
D. dinometer

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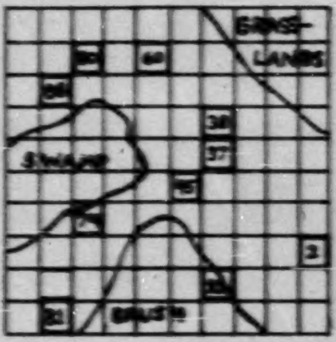
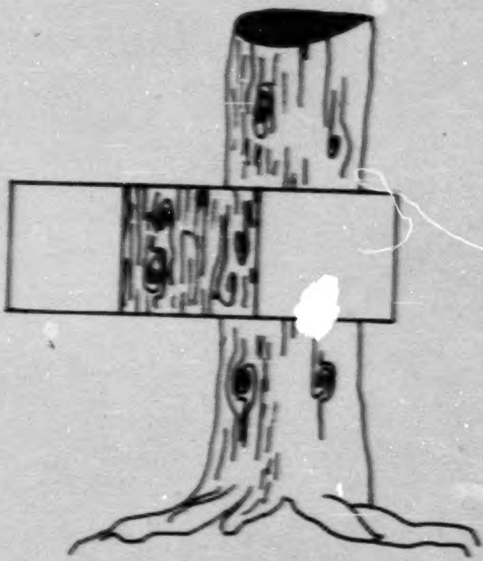


8. The type of cruise indicated in the above diagram where the designated plots are cruised is called the:

A. mechanical sampling method
B. random sampling method
C. variable plot method
D. blocking method



9. A tree observed through a wedge prism as in the above diagram:

A. should not be tallied
B. should be tallied
C. is a borderline case
D. both B and C are correct

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10. A quarter section of timber contains 40,000 board feet of Red Oak Saw Timber if the stumpage price of Red Oak is $60/M, the value of the Red Oak in the stand is:

A. $1400.00
B. $14000.00
C. $2400.00
D. $2800.00

11. The type of wood most commonly measured in cubic feet is:

A. pulpwood
B. sawtimber
C. poles and pilings
D. mine timbers

12. Linear measurement of forest products is most concerned with:

A. wood volume
B. length and strength
C. poles, pilings and railroad ties
D. both B and C are correct

13. In the diagram on the following page the distance between the Cruiser Stick and the mans' eye should be:

A. 15 inches
B. 22 inches
C. 25 inches
D. 27 inches

14. In the diagram on the following page the Cruiser is using a(an):

A. hypsometer
B. doyle scale
C. tree caliper
D. abney

GO TO NEXT PAGE

15. The cruiser in the diagram on the preceding page should be:

A. 66 feet from the tree
B. 30 paces from the tree
C. holding the cruiser stick 4½ feet from the ground
D. both A and C are correct

16. An increment borer's most important use is to determine a tree's:

A. age
B. growth rate
C. history
D. basal area

17. The angular variation of magnetic north as observed on a compass and true north is called the:

A. angle of variation
B. magnetic declination
C. general declination
D. magnetic variation

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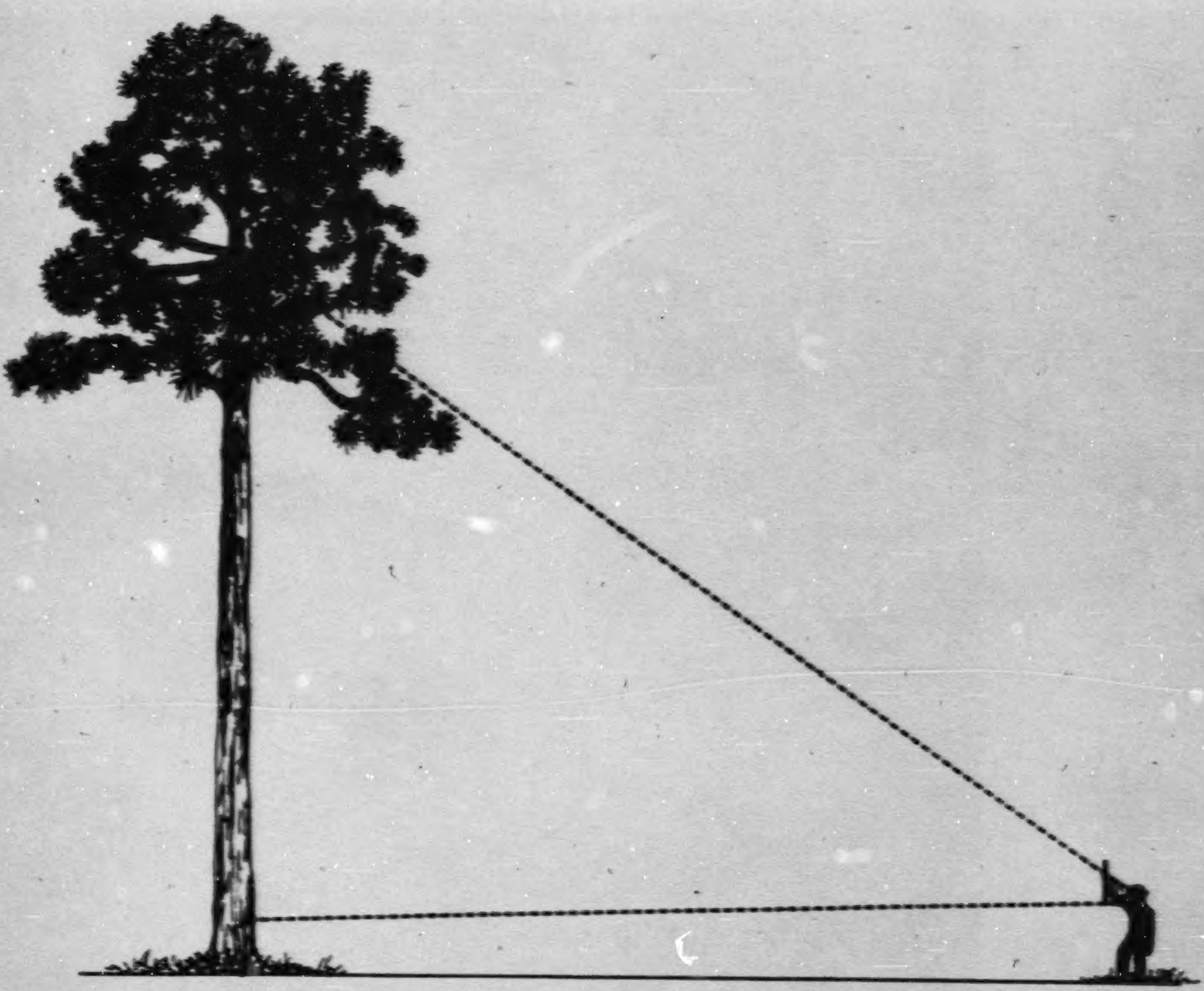
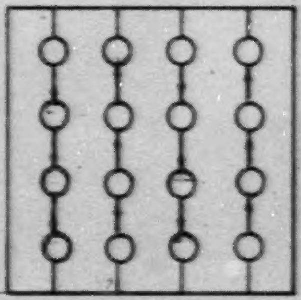
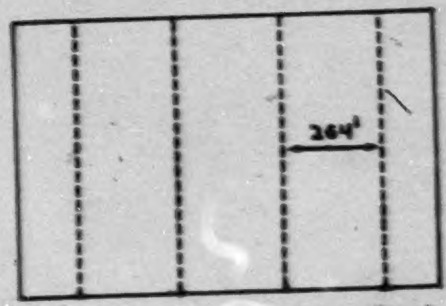


18. The type of cruise indicated in the diagram where the circled areas are located and cruised is called the:

A. strip cruising method
B. random sampling method
C. ocular cruise
D. line plot method





19. The above diagram indicates the centers of the strips on a one chain width strip cruise. The distance between the strip centers is 264 ft., therefore it is a:

A. 100 percent cruise
B. 75 percent cruise
C. 50 percent cruise
D. 25 percent cruise

20. When marking trees with an axe for commercial jobs:

A. blazes should be made completely around the tree
B. blazes should only be made at eye level
C. blazes should be made all in one compass direction
D. both B and C are correct

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21. The measurements of one standard cord of wood is:

A. 4' x 8' x 8'
B. 4' x 4' x 8'
C. 4' x 6' x 8'
D. 6' x 6' x 8'

22. Of the following instruments, which one would not be used to determine the DBH of a tree?

A. tree calipers
B. biltmore stick
C. diameter tape
D. increment borer

23. When using a Biltmore Stick to determine the DBH of a tree the zero end of the scale should be:

A. at the right
B. at the left
C. in the center of the tree
D. against the bark

24. A reduction in the width of the annual rings as indicated in a core taken from a tree with an increment borer would indicate a need for:

A. pruning
B. a thinning cut
C. a liberation cut
D. a clear cut

25. One acre is equal to:

A. 42,530 square feet
B. 20 square chains
C. an area 66' by 660'
D. both A and C are correct

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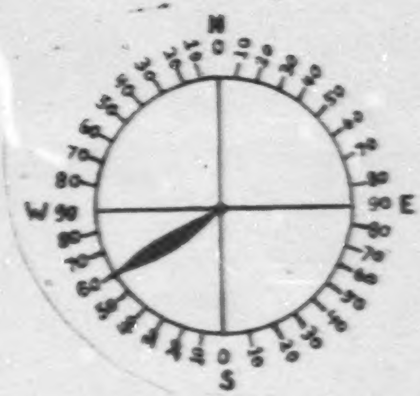

26. The N - S line of the compass has been aligned with a fence line, the bearing of the fence line is:

A. S 60 degrees W
B. W 60 degrees S
C. W 30 degrees S
D. S 30 degrees W

27. A planimeter is used to:

A. determine the acreage of a plot of land on a map
B. determine the bearings of lines on a map
C. determine the elevations of points on a map
D. both A and B are correct

28. A 25 percent cruise of a twenty acre forest yielded 2,000 board feet of White Oak. If stumpage price of White Oak is $80.00/M, the value of the White Oak in the stand is approximately:

A. $680.00
B. $840.00
C. $640.00
D. $160.00

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29. Using the line plot method a 40 acre area of forest is cruised using 16 1/4 acre circular plots. The results of the cruise showed a total of 3,000 board feet of yellow poplar in the plots. The approximate total value of the yellow poplar in the stand assuming a stumpage price of $70/M is:

A. $2100.00
B. $2800.00
C. $1800.00
D. $2400.00

END OF TEST

TABLE: 6-4 S
AREA: Agricultural Resources
TEST NO.: 6-4
KUDER-RICHARDSON 20: .561
KUDER-RICHARDSON 21: .503

N(tests) = 54

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.685	.750	.314	41.8
2.	D	.463	.800	.278	48.4
3.	D	.519	.649	.299	33.5
4.	D	.185	.750	.285	30.8
5.	C	.759	.818	.386	48.9
6.	A	.667	.780	.345	42.3
7.	C	.630	.685	.322	34.6
8.	B	.815	.125	.077	6.0
9.	B	.704	.780	.294	42.3
10.	C	.333	.827	.444	46.7
11.	A	.407	.729	.332	40.1
12.	D	.537	.800	.327	48.4
13.	C	.648	.750	.175	41.8
14.	A	.722	.218	.140	12.6
15.	A	.704	.876	.470	50.0
16.	B	.611	.750	.342	41.8
17.	B	.778	-.031	.055	-2.2
18.	D	.519	.203	.128	12.1
19.	D	.685	.685	.390	34.6
20.	C	.907	-.208	-.078	-8.2
21.	B	.426	.187	.144	11.5
22.	D	.463	.661	.288	34.1
23.	B	.574	.649	.252	33.5
24.	B	.463	.869	.449	56.0
25.	C	.759	.649	.222	28.0
26.	A	.389	.426	.255	24.2
27.	A	.759	.718	.198	35.2
28.	C	.704	.426	.206	26.9
29.	A	.481	.729	.446	40.7
30.					

AREA: AGRICULTURAL RESOURCES

Unit: Establishing an Outdoor Recreation Enterprise

Student Performance Objectives

The student should be able to:

1. Using federal, state and local data, identify the demands by the public for different types of outdoor recreation experiences in his region.

2. Inventory the outdoor recreation enterprises in a given area with accuracy needed to develop a list of additional outdoor enterprises that are feasible considering location, needed facilities and vegetation.

3. Make an analysis of a designated site to determine the alternative outdoor recreation enterprises that could be established there.

4. Select the three most suitable outdoor recreation enterprises for a designated area considering the alternative enterprises, location, community and management required.

5. Prepare a long-range development plan (5-10 years) for a selected enterprise considering initial and additional developments and management requirements.

6. Using cost and return data from similar enterprises, prepare a budget for a designated enterprise which would include fixed costs, variable costs, gross returns, net returns, and labor and management income.

7. When given a specific site and enterprise to be established, prepare a short-term development plan which includes facility construction, advertising and initial management needs.

AREA: AGRICULTURAL RESOURCES

Unit: Establishing an Outdoor Recreation Enterprise (6-5)

1. Of the following factors, the one that has contributed the most to the increase in demand for outdoor recreation enterprises is the:

   A. population movement from urban areas to the suburbs
   B. increase in the number of outdoor recreation enterprises available
   C. decrease in the number of hours in the work week
   D. leveling - off of the population explosion

2. Potable water is water suitable for:

   A. use in toilets
   B. swimming
   C. drinking
   D. showers

3. An example of complementary outdoor recreation enterprises would be:

   A. a private area near a state park with camping and picnic areas
   B. a private camping area near a state park with no camping facilities
   C. a pay fishing enterprise near a public lake
   D. a pay swimming beach near a public lake with swimming areas

4. The most important factor to consider when selecting the type of outdoor recreation enterprise for a site is:

   A. competitive enterprises in the area
   B. accessibility of the location
   C. the interests and objectives of the owner-operator
   D. the population of the area

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5. After selecting the outdoor recreation enterprise to be developed on a particular site, the first step is to:

A. secure adequate financing
B. determine the expected returns on the investment
C. make the basic changes in the terrain that are needed
D. prepare a long-range development plan

6. Property tax is an example of a:

A. variable cost
B. fixed cost
C. operating cost
D. investment cost

7. The national demand for outdoor recreation enterprises over the past 10 years has:

A. decreased
B. increased
C. remained the same
D. fluctuated greatly

8. A long-range development plan for an outdoor recreation enterprise generally would not include:

A. a list of ultimate facilities desired for the enterprise
B. a construction time table
C. detailed plan for advertising
D. a cost and return statement (budget)

9. Gross returns in a cost and return estimate refer to:

A. net returns minus variable costs
B. total returns for the enterprise
C. total returns minus fixed costs
D. the amount of profit made by the enterprise

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10. During the first stages of construction of a new outdoor recreation enterprise:

    A. publicity needs for the first year of operation should be determined
    B. the vegetation in the area should be removed to make construction easier
    C. zoning regulations for the area should be checked
    D. adequate financing should be obtained for the enterprise

11. Of the following enterprises, the one that usually would not be considered an outdoor recreation enterprise is a:

    A. vacation farm
    B. camping area
    C. putt-putt golf course
    D. horseback riding enterprise

12. When analyzing a potential outdoor recreation site, the least important consideration would be:

    A. the natural resources of the site
    B. available services
    C. state and local regulations and restrictions
    D. average income of families in the county

13. The best source of information concerning a potential outdoor recreation enterprise on a site would be:

    A. owners or operators of similar types of outdoor recreation enterprises
    B. a banker
    C. the Soil Conservation Service
    D. the Local Chamber of Commerce

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9

14. Net returns divided by the number of man-hours of unpaid labor in managing and maintaining the enterprise refers to:

A. labor and management income
B. net profit
C. total profit
D. income on investment

15. The major purpose for making an analysis of a proposed outdoor recreation site is to:

A. determine the strengths and weaknesses of the site
B. determine the type of enterprise the community will accept
C. determine the type of enterprise you are capable of managing
D. determine for what type of enterprise the site is best suited

16. Picnic and other day-use recreation areas should be within at least:

A. 15 miles of a population center
B. 50 miles of a population center
C. 75 miles of a population center
D. 90 miles of a population center

17. Variable costs in a cost and return statement refers to:

A. those costs which are incurred each year regardless of the business
B. operating costs
C. costs for such things as supplies, maintenance, and advertising
D. both B and C are correct

18. The best source of information concerning the quality of water in an area is:

A. the Soil Conservation Service
B. the Environmental Protection Agency
C. the State or County Department of Health
D. the local Waterworks Manager

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19. The natural resource essential to any recreation development is:

    A. forests
    B. fertile soil
    C. water
    D. all of the above are essential

20. The best advertising for an outdoor recreation enterprise after it has been established is:

    A. radio and t.v.
    B. newspaper
    C. magazines
    D. reputation and word-of-mouth

END OF TEST

TABLE: 6-5 S
AREA: Agricultural Resources
TEST NO.: 6-5
KUDER-RICHARDSON 20: .377
KUDER-RICHARDSON 21: .216

N(tests) = 180

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.633	.740	.380	41.5
2.	C	.461	.729	.332	40.8
3.	B	.711	.625	.318	30.2
4.	C	.828	.368	.254	18.5
5.	D	.406	.818	.415	49.5
6.	B	.717	.294	.186	17.6
7.	B	.072	.673	.366	23.5
8.	C	.433	.625	.254	32.3
9.	B	.606	.760	.334	43.2
10.	A	.906	.141	.103	5.0
11.	C	.444	.780	.306	45.4
12.	D	.311	.707	.285	36.0
13.	A	.622	.454	.226	28.4
14.	A	.461	.780	.367	46.2
15.	A	.811	.718	.223	26.1
16.	B	.689	.426	.254	26.5
17.	D	.261	.368	.164	18.8
18.	C	.567	.800	.353	47.6
19.	C	.833	.279	.126	14.7
20.	D	.261	.685	.291	30.7
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

AREA: AGRICULTURAL RESOURCES

Unit: Land Use Classification and Conservation Practices

Student Performance Objectives

The student should be able to:

1. Using the five major determinants of land capability, classify a designated soil into one of the eight land capability classes with accuracy required of a soil conservation service aide.
2. When observing a specified land area, select the optimum land use system for the land class with accuracy required of a soil conservation service aide.
3. Considering the land capability and optimum land use system on a given area, recommend and implement the conservation practices which would result in minimum soil loss.

AREA: AGRICULTURAL RESOURCES

Unit: Land Use Classification and Conservation Practices (6-6)

1. Of the following soil characteristics which is not one of the five used to classify land as to its capability?

   A. slope
   B. amount of erosion
   C. depth of surface soil
   D. structure of surface soil

2. A restrictive layer composed of clay, silt, sand, or broken rock cemented together is called a:

   A. hard pan
   B. soil pan
   C. clay base
   D. soil horizon

3. A deep soil means that the distance to a layer which will prevent root development is approximately:

   A. 10 to 18 inches
   B. 20 to 26 inches
   C. 28 to 32 inches
   D. over 36 inches

4. The class of land that is generally recommended for establishment as permanent pasture is:

   A. class III
   B. class VI
   C. class VII
   D. class VIII

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5. Grass waterways:

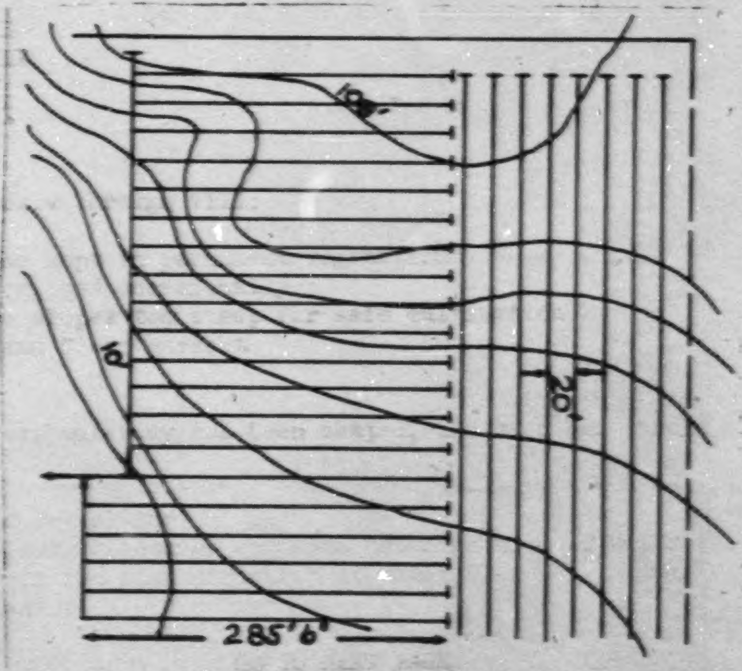
A. carry off water not absorbed by the soil
B. should be "plowed shut" every 2 to 4 years
C. will prevent soil from washing off adjoining slopes
D. are not necessary if strip cropping is used

6. When determining the size of a diversion ditch, the following factor which would not be important is:

A. size of the watershed area
B. maximum run-off in cubic feet per second
C. permissible velocity
D. soil structure

7. From looking at this layout, you can tell that the tile spacing is going to be:

A. 285'6"
B. 108'
C. 10'
D. 20'



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8. Of the following recommended conservation practices, the most appropriate for Class VI land would be to:

A. construct and maintain sod waterways
B. strip crop with contour tillage
C. apply lime and fertilizer according to soil tests
D. provide for adequate surface drainage

9. The most accurate means of identifying the soil air and water relationship is by:

A. observing moist subsoil color
B. observing moist topsoil color
C. observing the texture of the subsoil
D. determining the subsoil temperature

10. Percent of slope refers to:

A. $\frac{\text{rise}}{\text{run}} \text{ x } 100$
B. the number of feet of vertical rise or fall in 100 feet of horizontal distance
C. $\frac{\text{run}}{\text{rise}} \text{ x } 100$
D. both A and B are correct

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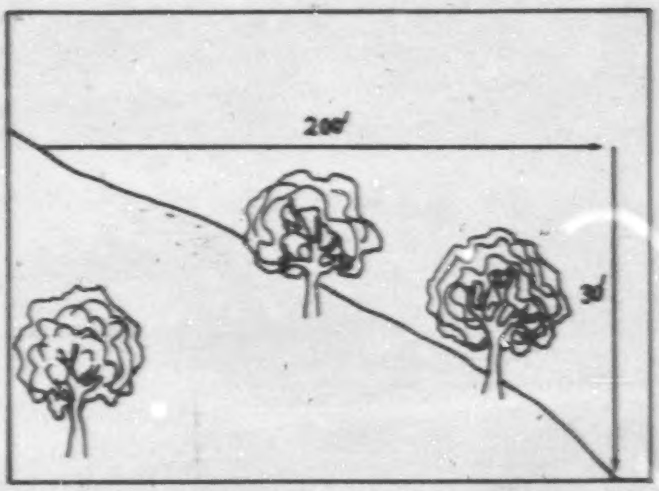


11. In the above diagram, the percent of slope is:

A. 10%
B. 15%
C. 20%
D. 30%

12. Land that has no limitations except for slow air and water movement would be considered:

A. class II
B. class III
C. class V
D. class VI

13. Land classes V through VIII:

A. should be kept in permanent vegetation
B. can be cropped occasionally
C. all have slopes too steep for safe cultivation
D. both A and C are correct

14. After a grass waterway has been shaped, the seed bed should be prepared by:

A. dragging or rolling
B. plowing and/or disking opposite the direction of water flow
C. plowing in the same direction of water flow
D. both A and B

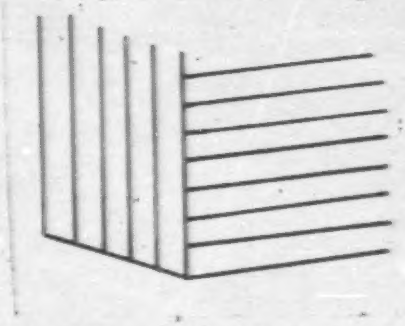
GO TO NEXT PAGE

15. In the field strip cropping, the strips:

A. conform to the contour
B. are of varying width
C. are placed across the general slope but not on the contour
D. both B and C are correct

16. The tile drainage system illustrated below is:

A. gridiron type
B. double main type
C. herringbone type
D. parallel type



17. A recommended conservation practice on Class VII land with low soil fertility is to:

A. seed the area to a grass or legume and crop only occasionally
B. lime and fertilize according to soil tests
C. plant conifers
D. both A and B are correct

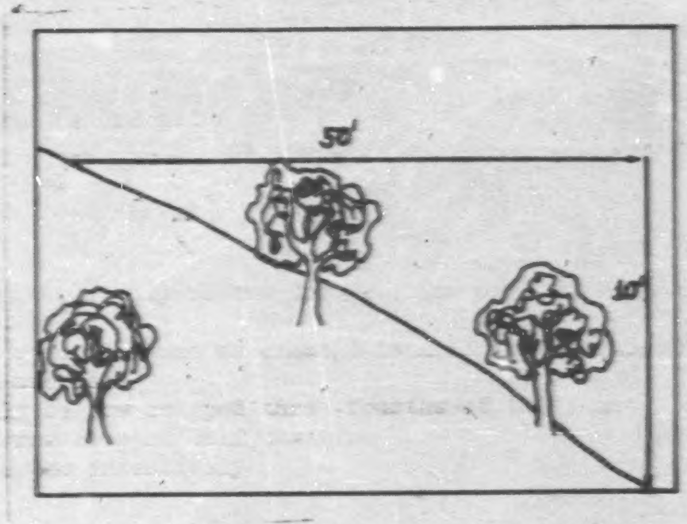
18. The U.S. Soil Conservation Service divides land capability into:

A. 6 classes
B. 8 classes
C. 10 classes
D. 12 classes

GO TO NEXT PAGE

19. On a soils map, an area is colored yellow, the land capability class is:

A. class I
B. class II
C. class III
D. class IV



20. In the above diagram, the percent of slope is:

A. 5%
B. 10%
C. 20%
D. 25%

21. A heavy texture soil would be composed of high amounts of:

A. sand
B. silt
C. clay
D. humus

22. Continuous row cropping would be recommended for:

A. class I land
B. class I and class II land
C. class I, II, and III land
D. classes I-IV if appropriate soil and water management practices are used

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23. Of the following grasses and legumes, the one that should not be used for seeding in grass waterways is:

A. alfalfa
B. tall fescue
C. reed canary grass
D. bromegrass

24. The kind of strip cropping in which strips of grass or legume crops are laid out between even width strips of row crops is called:

A. contour strip cropping
B. field strip cropping
C. buffer strip cropping
D. wind strip cropping

25 The width between drainage ditches is most affected by the:

A. depth of tile placing
B. length of tile system
C. diameter of drainage tile
D. width of field

26. Trees planted in gullies on idle fields should be spaced:

A. 3-4 feet apart
B. 6-8 feet apart
C. 12-15 feet apart
D. 18-24 feet apart

27. Soil texture refers to:

A. the relative percentage of sand, clay, and loam in the soil
B. the relative proportion of each size of soil aggregates in a soil mixture
C. the percentage of clay in the soil mixture
D. the relative proportions of sand, clay, and silt in a soil mixture

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28. Mottling in the subsoil is an indication of:

A. good air and water movement
B. poor air and water movement
C. a high mineral content
D. a low water table

29. Class IV land:

A. should never be cropped
B. should be cropped only occasionally
C. is permanently wet
D. both A and C are correct

30. Class II land whose only restriction is slow air and water movement:

A. can be cropped the same as class I land if appropriate drainage practices are used
B. should only be row cropped three-fourths of the time
C. should be row cropped half the time
D. can be cropped intensively

31 Farming on the contour:

A. usually results in lower yields
B. will result in savings in fuel costs
C. makes the rows shorter
D. wastes more land than does straight rows

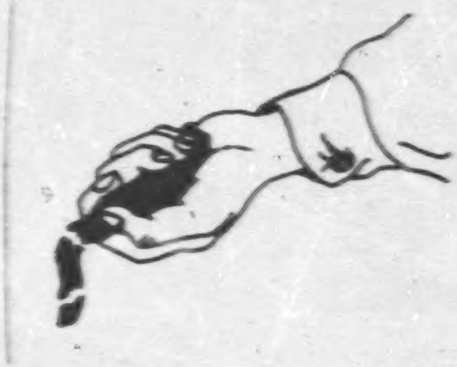
32. The major differences between a diversion and a grass waterway is:

A. a diversion is used on level ground while the grass waterway is used on sloping ground
B. a diversion takes water from only one side while a grass waterway receives water from both sides
C. a diversion is usually smaller than a grass waterway
D. a diversion will carry more water than will a grass waterway

GO TO NEXT PAGE

33. Recommended conservation practices on class III land with 6-12% slope would not include:

A. contouring
B. developing grass waterways
C. strip cropping
D. providing surface drainage



34. From the diagram of a person using the "feel" method of determining soil texture, the soil is:

A. medium textured
B. coarse textured
C. fine textured
D. clayey

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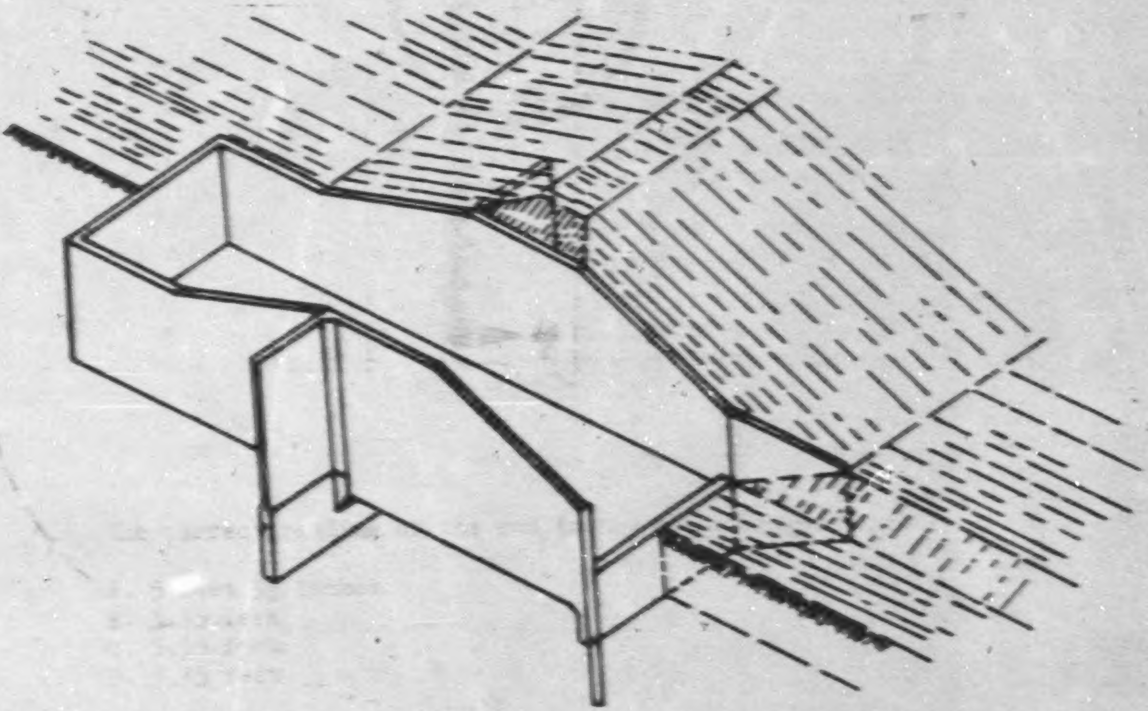
35. The conservation structure in the diagram below is a:

A. straight drop spillway
B. chute spillway
C. box inlet drop spillway
D. 90° notch weir



END OF TEST

TABLE: 6-6 S
AREA: Agricultural Resources
TEST NO.: 6-6
KUDER-RICHARDSON 20: .354
KUDER-RICHARDSON 21: .202
N(tests) = 12

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	D	.917	.790	.222	33.3
2.	A	.333	.861	.372	50.0
3.	D	.583	.000	.675	100.0
4.	B	.667	-.661	.019	-25.0
5.	A	.583	.264	.249	16.7
6.	D	.417	-.264	.231	-16.7
7.	D	.583	-.264	-.338	-16.7
8.	C	.750	-.661	-.061	-25.0
9.	A	.833	.141	-.235	-8.3
10.	D	.417	-.141	-.142	-8.3
11.	B	.167	.661	.024	25.0
12.	A	.667	.000	.632	100.0
13.	A	.833	-.661	-.024	-25.0
14.	B	.750	-.861	-.121	-50.0
15.	C	.833	-.861	-.376	-50.0
16.	A	.833	.000	.188	00.0
17.	C	.917	.790	.222	33.3
18.	B	.500	.000	.736	100.0
19.	B	.833	-.661	-.024	-25.0
20.	C	.333	.861	.483	50.0
21.	C	.333	.976	.650	75.0
22.	A	.917	.000	.127	00.0
23.	A	.833	-.661	-.024	-25.0
24.	C	.417	.740	.444	41.7
25.	A	.999	.000	.000	00.0
26.	B	.500	.740	.315	41.7
27.	D	.750	.141	.182	8.3
28.	B	.417	.861	.071	50.0
29.	B	.500	.969	.526	66.7
30.	A	.583	.976	.515	75.0

TABLE: 6-6 S
AREA: Agricultural Resources
TEST NO.: 6-6

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
31.	B	.667	.969	.353	66.7
32.	B	.583	-.264	.142	-16.7
33.	D	.583	.790	.355	33.3
34.	A	.917	.000	.127	00.0
35.	C	.583	.141	.195	8.3
36.					
37.					
38.					
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42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

TABLE: 6-6 A
AREA: Agricultural Resources
TEST NO.: 6-6
KUDER-RICHARDSON 20: .642
KUDER-RICHARDSON 21: .598
N(tests) = 70

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	D	.871	.264	.268	11.7
2.	A	.286	.891	.492	54.2
3.	D	.671	.718	.424	39.2
4.	B	.643	.853	.526	53.3
5.	A	.486	.853	.469	54.2
6.	D	.700	.673	.390	32.5
7.	D	.457	.827	.300	50.8
8.	C	.571	.047	.090	3.3
9.	A	.800	.339	.202	17.5
10.	D	.614	-.339	-.183	-20.8
11.	B	.443	.876	.496	56.7
12.	A	.571	.625	.251	31.7
13.	A	.814	.249	.345	14.2
14.	B	.757	-.141	-.046	-8.3
15.	C	.629	.661	.331	35.0
16.	A	.571	.994	.652	81.7
17.	C	.600	.951	.499	65.8
18.	B	.286	.809	.464	45.0
19.	B	.729	.156	.067	8.3
20.	C	.443	.809	.386	45.0
21.	C	.586	.047	.050	2.5
22.	A	.843	.264	.092	11.7
23.	A	.414	.309	.256	20.0
24.	C	.657	.249	.145	15.0
25.	A	.800	.249	.162	12.5
26.	B	.529	-.047	-.029	-2.5
27.	D	.543	.790	.355	46.7
28.	B	.500	.740	.416	41.7
29.	B	.500	.898	.403	60.0
30.	A	.429	.905	.505	60.8

TABLE: 6-6 A
AREA: Agricultural Resources
TEST NO.: 6-6

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
31.	B	.771	.156	.203	8.3
32.	B	.614	.718	.402	40.0
33.	D	.757	.094	.111	5.0
34.	A	.900	-.637	-.282	-20.8
35.	C	.443	.279	.148	18.3
36.					
37.					
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AREA: AGRICULTURAL RESOURCES

Unit: Elementary Surveying

Student Performance Objectives

The student should be able to:

1. When given a specified surveying task, select the type of legal or conservation survey whose definition applies to the task.

2. When given examples of the common types of levels and transits, identify the different parts and their functions and transport, carry, set up, and maintain the instruments in a manner which will prevent damage or unnecessary wear.

4. When given the four types of surveying rods, list the specific uses that are made of each type with 100% accuracy.

5. Using the needed surveying instruments, perform the operations used in surveying including the use of hand signals for communication between the instrument man and rod man with accuracy needed to perform surveying operations.

6. When given appropriate surveying instruments and a specified land area to be surveyed, perform each of the three methods of conservation surveying (differential leveling, profile leveling, and topographic surveying) and record field notes with accuracy required of a Soil Conservation Aide.

7. Using a hand level, determine slopes with accuracy within 2% slope.

AREA: AGRICULTURAL RESOURCES

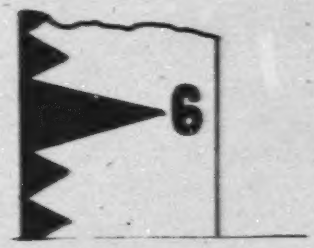
Unit: Elementary Surveying (6-7)

1. For tiling a field, the primary type of leveling that would be used is:

   A. topographic
   B. differential
   C. profile
   D. construction

2. When setting up the transit or level on a sidehill:

   A. two tripod legs should be placed at the same elevation uphill with the third leg downhill
   B. one tripod leg should be placed uphill, one downhill, and one horizontal to the instrument
   C. two tripod legs should be placed at the same elevation downhill with the third leg uphill
   D. the tripod legs should be placed close together to make leveling the foot plate easier



3. The rod from which the section in the diagram above was taken is a:

   A. Detroit level rod
   B. stadia rod
   C. Philadelphia rod
   D. California rod

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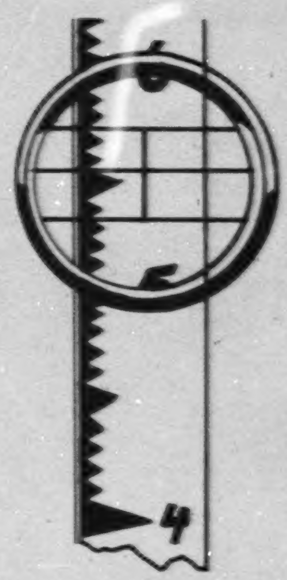

4. The correct reading of the rod in the above diagram is:

   A. 5 feet 3½ inches
   B. 5.35 feet
   C. 5.55 feet
   D. 5.75 feet

5. The distance between the instrument and rod in the diagram is:

   A. 20 feet
   B. 200 feet
   C. 40 feet
   D. 400 feet

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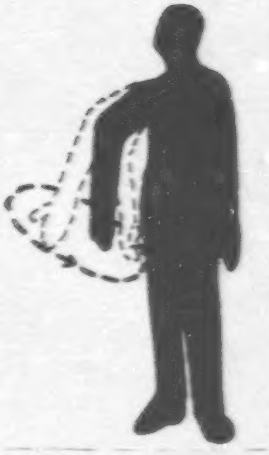

6. In the above diagram, the instrument man is indicating to the rod man:

   A. that the rod is upside down
   B. to establish a turning point
   C. to move down
   D. to come in

7 A foresight reading is:

   A. added to a know elevation to determine the height of instrument
   B. added to the height of instrument to determine the new elevation
   C. taken on a bench mark to start a differential leveling survey
   D. a reading taken on a point of unknown elevation

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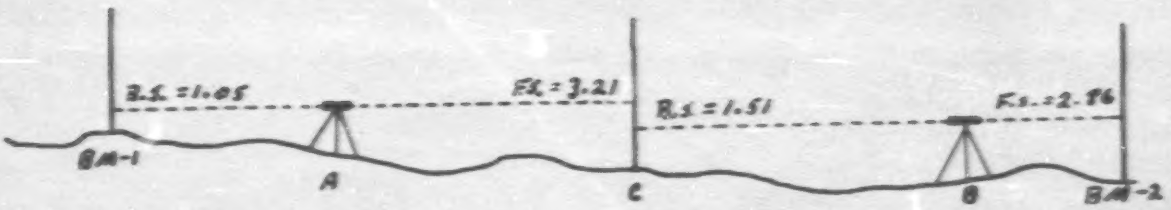

8. In the above diagram, if the elevation at BM-1 is 100 feet above sea level the height of the instrument at point A is:

   A. 98.95
   B. 103.21
   C. 96.79
   D. 101.05

9. In the above diagram, if the elevation at BM-1 is 100 feet above sea level the height of the instrument at point B is:

   A. 101.51
   B. 99.35
   C. 102.86
   D. 98.49

10. In the same diagram, the elevation of BM-2 is:

    A. 97.84
    B. 106.07
    C. 96.49
    D. 99.35

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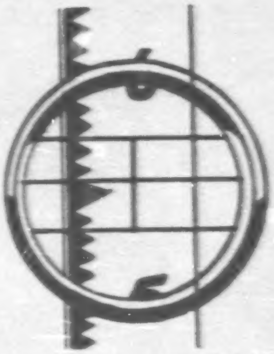
STA	B.S.	H.I.	F.S. or Grade Rod	Elev. or Planned Elev.
BM-1	3.11	103.11		100.00
0 + 00			4.67	98.44
0 + 50			4.58	98.53
1 + 00			4.50	98.61
1 + 50			4.12	98.99
2 + 00			3.87	99.24
2 + 50			3.63	99.48

11. The section of the field notebook shown above indicates the results of:

A. differential leveling
B. profile leveling
C. topographic leveling
D. both A and B are correct



12. The instrument in the above diagram is used for topographic surveying because it is equipped with:

A. cross-hairs
B. stadia hairs
C. a vertical hair
D. both A and B are correct

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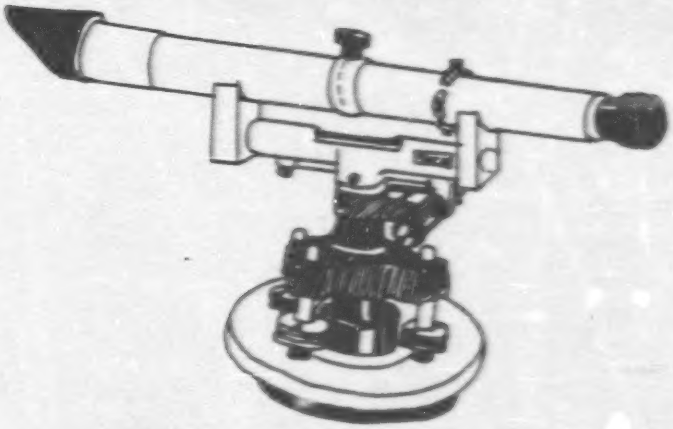
13. The metes and bounds system is a type of:

A. conservation survey
B. legal survey
C. topographic survey
D. profile leveling



14. The type of level or transit diagrammed above is:

A. farm level
B. transit-level
C. contractors' level
D. dumpy level

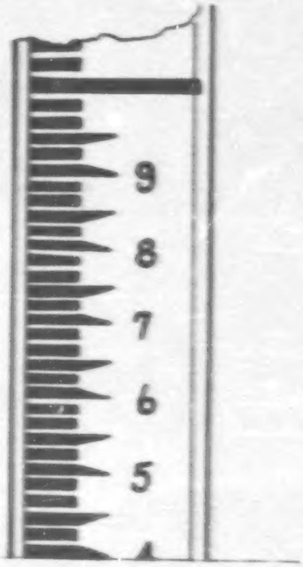
GO TO NEXT PAGE

15. In order to determine the general slope for an entire field, the type of surveying that would be used is:

A. profile
B. topographic
C. differential
D. field

16. When walking in the field with a transitor level, it should be carried:

A. over the shoulder with the level toward the front
B. over the shoulder with the level toward the rear
C. under the arm with the level toward the front
D. under the arm with the level toward the rear



17. The rod from which the section in the diagram above was taken is a:

A. Detroit level rod
B. stadia rod
C. Philadelphia rod
D. standard rod

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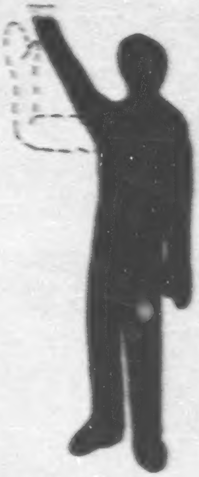

18. In the above diagram, the instrument man is indicating to the rod man:

    A. to move on
    B. to wave the rod slowly
    C. to move up
    D. to use the long rod

19. By taking a backsight on a known elevation and adding the backsight value to the elevation the instrument man is able to determine:

    A. the elevation of the turning point
    B. the elevation of the benchmark
    C. the height of instrument
    D. the foresight reading

20 A bench level circuit:

    A. must always close on an official benchmark
    B. is used only when doing topographic surveying
    C. will enable you to tell the difference in elevation between 2 points
    D. both A and C are correct

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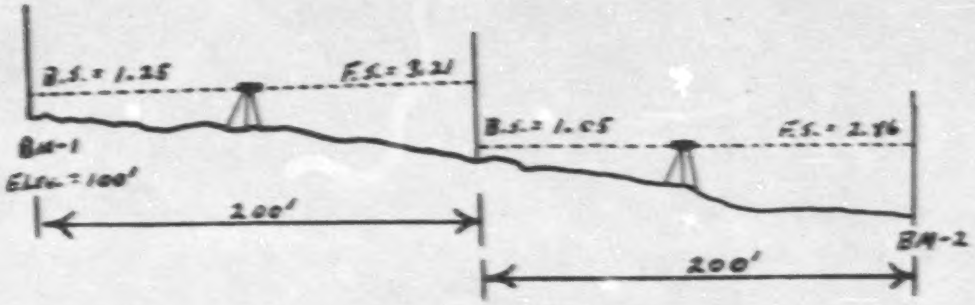

21. Using the data from the above diagram, the correctly completed page in a field notebook with the correct data would be indicated by:

A.

STA.	B.S.	H.I.	F.S. or Grade Rod	Elev. or Planned Elev.	Dist.
BM-1	1.25	98.75		100.00	200
TP-1	1.05	97.70	3.21	101.96	200
BM-2			2.86	99.10	

B.

STA.	B.S.	H.I.	F.S. or Grade Rod	Elev. or Planned Elev.	Dist.
BM-1	1.25	101.25		100.00	200
TP-1	1.05	99.09	3.21	98.04	200
BM-2			2.86	96.23	

C.

STA.	B.S.	H.I.	F.S. or Grade Rod	Elev. or Planned Elev.	Dist.
BM-1	1.25	98.75		100.00	200
TP-1	1.05	97.70	2.86	99.10	200
BM-2			3.21	101.96	

D.

STA.	B.S.	H.I.	F.S. or Grade Rod	Elev. or Planned Elev.	Dist.
BM-1	1.25	98.75		100.00	200
TP-1	3.21	97.70	1.05	101.96	200
BM-3	2.86			99.10	

GO TO NEXT PAGE

22. From the data on the preceding page, the percent of slope between BM-1 and BM-2 is:

A. 2%
B. 1.8%
C. 1.4%
D. .94%

23. Profile leveling would be used for:

A. tiling
B. construction terraces
C. making topographic maps
D. both A and B are correct

24. On a vernier or compass one degree is equal to:

A. 10 minutes
B. 30 minutes
C. 60 minutes
D. 100 minutes

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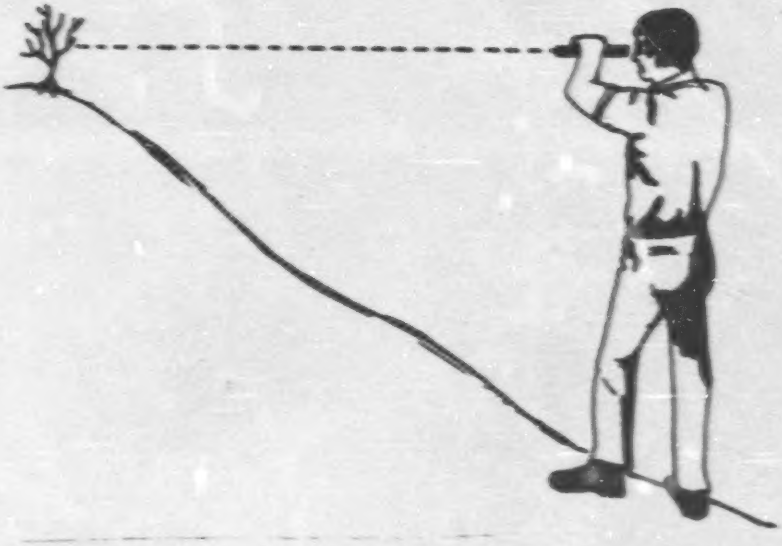

25. The person in the above diagram is standing 50' from the bush. His height at eye level is 5 feet 6 inches, therefore the percent of slope is:

    A. 5.5 percent
    B. 11.0 percent
    C. 16.0 percent
    D. 20.0 percent

26. The type of leveling used to determine the difference in elevation of various key point in an area is:

    A. topographic surveying
    B. profile leveling
    C. construction leveling
    D. differential leveling

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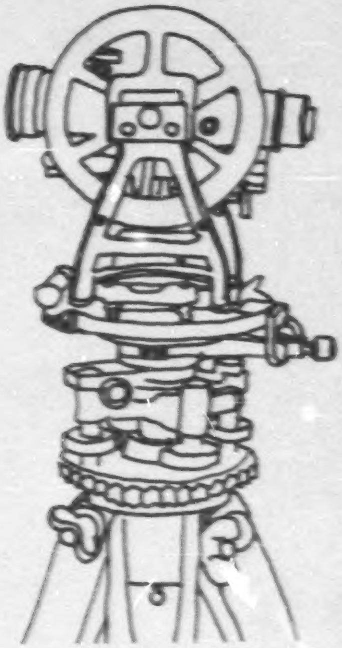

27. The type of level or transit diagrammed above is a:

A. farm level
B. contractors' level
C. transit-level
D. dumpy level

28. A turning point is established so that:

A. a backsight can be taken and the HI calculated
B. the instrument man will be able to see the rod man
C. a foresight can be taken and the elevation determined
D. both B and C are correct

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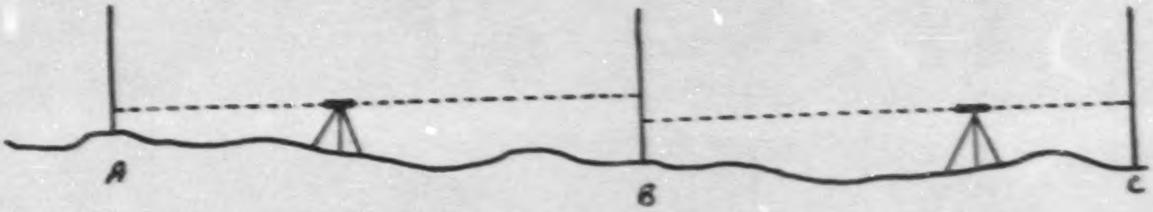

29. In the above diagram B is called a:

A. temporary bench mark
B. turning point
C. leveling point
D. fixed rod location

30. When profile leveling, a backsight is taken to determine:

A. the elevation of the benshmark
B. the amount to add to the foresight readings
C. the elevation of an unknown point
D. the height of the instrument

31. To obtain a true topographical survey of an area, the method of topographical surveying to use is:

A. the grid system
B. the plain table and alidade system
C. the transit and stadia method
D. the differential leveling method

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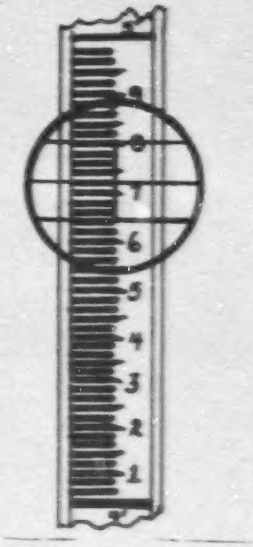

32. The correct reading of the rod is:

A. 4.65 feet
B. 4.73 feet
C. 4.81 feet
D. 4 feet 7 inches

33. In the diagram above, the distance between the instrument and rod is:

A. 160 feet
B. 60 feet
C. 40 feet
D. 16 feet

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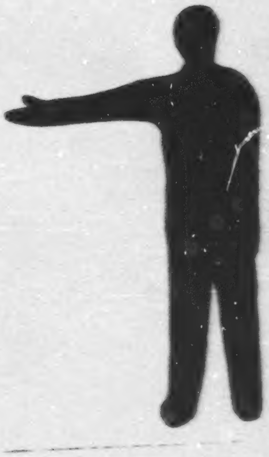

34. In the above diagram, the instrument man is indicating to the rod man:

A. to move to his left
B. to move down
C. to move to his right
D. that the observation is completed

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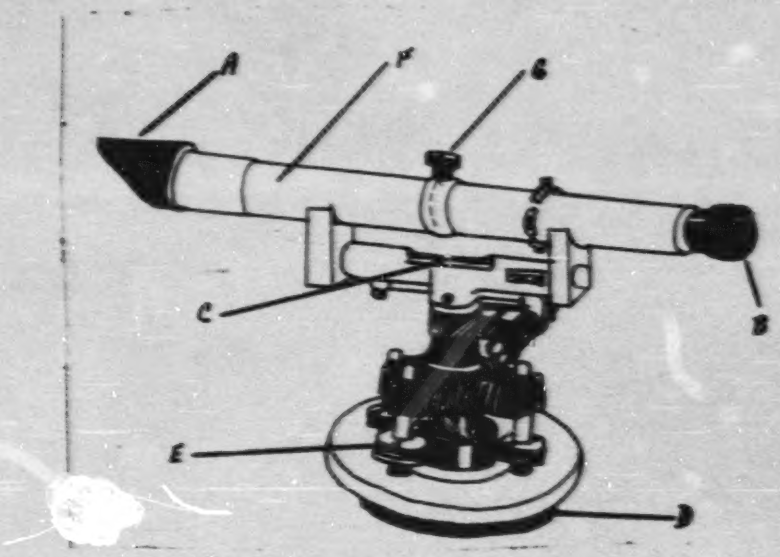

Indicate beside the following terms the corresponding parts on the above diagrammed instrument.

35. Foot Plate ______

36. Leveling Screw ______

37. Telescope ______

38. Spirit Level ______

39. Eyepiece ______

40. Sunshade ______

41. Focusing Screw ______

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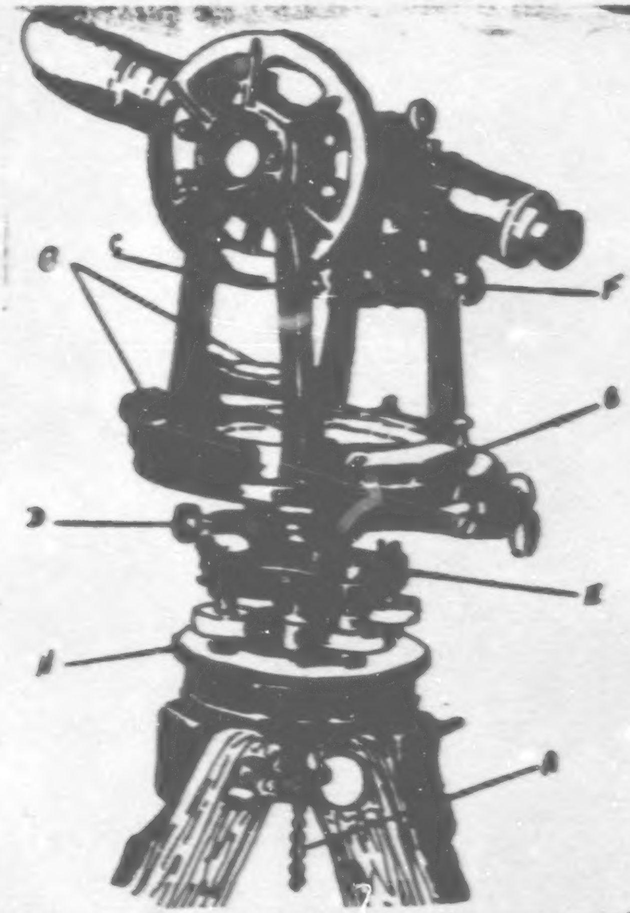

Indicate beside the following terms the corresponding parts on the above diagrammed instrument.

42. Plate Level ______

43. Vernier ______

44. Leveling Head ______

45. Shifting Plate ______

46. Lower Clamp Tangent Screw ______

47. Telescope Tangent Screw ______

48. Plumb Bob Chain ______

49. Vertical Circle Vernier ______

END OF TEST

TABLE: 6-7 A
AREA: Agricultural Resources
TEST NO.: 6-7
KUDER-RICHARDSON 20: .618
KUDER-RICHARDSON 21: .412
N(tests) = 22

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	C	.727	.000	.106	00.0
2.	C	.318	.637	.232	33.3
3.	B	.318	.960	.429	66.7
4.	C	.227	.294	.149	16.7
5.	C	.545	-.264	.076	-16.7
6.	D	.773	.000	-.052	00.0
7.	D	.591	.827	.434	50.0
8.	D	.864	.770	.514	33.3
9.	B	.727	.264	.015	16.7
10.	C	.455	.998	.599	83.3
11.	B	.818	-.294	.082	-16.7
12.	B	.955	.000	-.158	00.0
13.	B	.500	.941	.499	66.7
14.	D	.955	-.454	-.207	-16.7
15.	B	.545	.264	.199	16.7
16.	C	.864	.454	.039	16.7
17.	C	.727	.827	.472	50.0
18.	D	.727	.770	.312	33.3
19.	C	.864	-.454	-.109	-16.7
20.	C	.636	.661	.279	33.3
21.	B	.682	.294	-.013	16.7
22.	D	.909	-.454	.264	-16.7
23.	D	.727	.827	.335	50.0
24.	C	.682	.827	.381	50.0
25.	B	.682	.000	.140	00.0
26.	D	.318	.661	.385	33.3
27.	C	.500	.941	.520	66.7
28.	D	.682	.294	.162	16.7
29.	B	.773	.661	.386	33.3
30.	D	.864	.000	.039	00.0

TABLE: 6-7 A
AREA: Agricultural Resources
TEST NO.: 6-7

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
31.	B	.818	.000	.055	00.0
32.	B	.591	.264	.227	16.7
33.	D	.909	.000	.019	00.0
34.	A	.409	-.264	-.123	-16.7
35.	A	.045	.454	.305	16.7
36.	A	.182	.884	.447	50.0
37.	A	.091	.770	.371	33.3
38.	A	.182	.884	.473	50.0
39.	A	.000	.000	.000	00.0
40.	A	.045	.454	.207	16.7
41.	A	.136	.770	.377	33.3
42.	A	.999	.000	.000	00.0
43.	A	.909	454	.267	16.7
44.	A	.909	.000	.019	00.0
45.	A	.955	.000	-.109	00.0
46.	A	.409	.770	.353	33.3
47.	A	.500	.941	.438	66.7
48.	A	.091	.454	.229	16.7
49.	A	.636	.827	.576	50.0
50.					

AREA: AGRICULTURAL RESOURCES

Unit: Water Supply and Quality Determination

Student Performance Objectives

The student should be able to:

1. Write a description of the hydrologic cycle processes which should include precipitation, evaporation, transpiration and condensation.

2. When given a specified land area, identify the available surface water and ground water supplies which should include waterways, water impoundments and aquifers.

3. When given a specified community size and location, estimate the annual, monthly and daily demand for water to the satisfaction of the instructor.

4. Using water test kits, determine the quality of a given sample of water within the limits of the testing equipment.

5. When given a specfied watershed, identify the present and potential sources and types of water pollution and their effects on the natural resources of the area.

6. When given a watershed with identified water pollution sources, determine the alternative methods which could be used to correct the problem to meet local and/or state pollution regulations.

AREA: AGRICULTURAL RESOURCES

Unit: Water Supply and Quality Determination (6-13)

1. Of the following water sources, the one which would be considered a surface water supply is a(n):

A. artesian well
B. spring
C. stream
D. deep well

2. Of the following water sources, the one which would usually require the most extensive treatment so as to be safe for human consumption is:

A. a river
B. a natural lake
C. an impounding reservoir
D. an artesian well

3. Of the total demand for water in most communities, the percentage that is used for domestic purposes is approximately:

A. 25%
B. 35%
C. 45%
D. 55%

4. Providing an adequate water supply in the future will be accomplished primarily by:

A. demineralization of ocean water and other highly mineralized water
B. developing fresh water supplies to their fullest extent
C. decreasing the amount of pollution in present water supplies thereby making more water available
D. limiting the amount of water households and industries may use

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5. Surface water supplies of water:

A. are safe for human consumption
B. must be aerated before they are safe for human consumption
C. are considered unsafe for human consumptionunless chemically treated
D. are safe for human consumption unless they are turbid

6. The best way to find the daily, weekly, and monthly water consumption rates in a community is to:

A. determine what one household and one industry uses and multiply the answer by the number of each in the community
B. consult water treatment plants records
C. consult water pumping and reservoir water level records
D. both B and C are correct

7. Of the following conditions which affect the daily amount of water used in a community, the one having the greatest influence is:

A. the climate
B. the economic status of the people
C. thr cost of the water
D. the quality of the available water

8. Potable water is water pure enough for:

A. use in toilets
B. swimming
C. drinking
D. showers

9. Of the following water problems, the one which causes the greatest objections to underground water supplies is:

A. the presence of harmful bacteria
B. hardness
C. odor
D. turbidity

GO TO NEXT PAGE

10. Of the following, the one which would be considered a source of "pure" water is a:

A. spring
B. river
C. dug well
D. none of the above

11. Of the following water characteristics, those which must be measured immediately upon taking the sample include:

A. temperature and color
B. pH and dissolved oxygen
C. temperature and setteable solids
D. color and pH

12. When determining the location of water sampling stations on a stream or river, the least important factor to consider is the:

A. location of pollution sources
B. location of tributaries
C. physical characteristics of the stream
D. type of sampling equipment used

13. To be sure the water sample that is taken from a stream or impoundment is not contaminated by anything left in the bottle.

A. the sample bottle must be sterilized before the sample is taken regardless of the tests to be made
B. a new bottle should be used for each sample
C. the sample bottle should be rinsed in the water several times before the sample is taken
D. the sample bottle should be treated with formaldehyde before sampling

14. A portion of water identical in content to that in the larger body of water being sampled is called:

A. a selective sample
B. a proportionate sample
C. a representative sample
D. a "grab" sample

GO TO NEXT PAGE

15. When sampling the water in flowing streams or rivers, the most accurate method is to:

A. take the sample from the same location along the bank each time
B. take the sample from the center of the stream or river
C. take samples of cross-sections of the stream or river
D. take samples in a zig-zag pattern

16. The appropriate volume of water to be taken in a sample:

A. is determined by the laboratory tests being made
B. should include enough to allow for a retest of the sample
C. should be at least one liter
D. both A and B are correct

17. A BOD test of a water sample:

A. depends upon measuring the reduction of dissolved oxygen in the sample
B. is often made of a sample that has been preserved with sulfuric acid
C. determines the biochemical oxygen demand in the water
D. all of the above are correct

18. Water samples that are to be used for dissolved oxygen determination:

A. should be preserved by refrigeration at 10° C
B. should be tested on site
C. can be preserved using sodium thiosulfate
D. can be preserved using copper sulfate

19. The most reliable test of the pH of a water sample is accomplished by:

A. colorimetric methods
B. using a pH meter
C. using litmus paper
D. using titration methods

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20. The presence of arsenic in a water sample usually indicates the presence of:

A. industrial wastes
B. domestic sewage
C. agricultural wastes
D. either A or B

21. The location of water sampling stations, types of samples, frequency, and time of day of collecting samples is influenced primarily by:

A. the depth of the impoundment
B. the overall objectives of the survey
C. the size of the impoundment
D. the type of poullutants found in the water

22. Of the following processes, the one that would be considered a part of the tertiary wastewater treatment process is:

A. clarification
B. activated sludge
C. coagulation
D. disinfection

23. The word normal (n) in front of the name of a reagent indicates:

A. it is a standard solution
B. the reagent is pure
C. the concentration of strength
D. its grade

24. The symbol mg/l means:

A. milligrains per liter
B. milligrams per liter
C. grams of magnesium per liter
D. micrograms per liter

GO TO NEXT PAGE

25. The process of determining the strength or concentration of a substance in a solution by finding the smallest amount of reagent that will bring about a give effect in the solution is:

A. the tristimulum method
B. distillation
C. titration
D. the gravimetric method

26. The best recommendation(s) for preventing water pollution by fertilizer and pesticides is:

A. following usage recommendations on the labels
B. growing all crops organically
C. using proper soil conservation practices
D. both A and C are correct

27. Primary treatment of wastewater in wastewater treatment plants consists primarily of:

A. biological processes
B. settling out of solid matter
C. chlorination
D. oxidation of organic matter

28. One gram (g) is equivalent to:

A. 1,000 milligrams
B. 100 milligrams
C. 10 milligrams
D. 5 milligrams

29. A pH reading of 6.7 is:

A. strong alkaline
B. weak alkaline
C. strong acid
D. weak acid

GO TO NEXT PAGE

30. The indicator organism used for evaluating biological suitability of water for recreation purposes (boating, fishing, swimming) is:

A. fecal coliform
B. blue-green algae
C. cladophora
D. actinomycete

31. Water pollution:

A. means those undesirable conditions in water caused by man
B. is often caused by natural processes
C. includes sediment
D. both B and C are correct

32. A major reason for pollution by septic tank/drain field operation is:

A. drain fields placed too close to the water table
B. poor filtration of effluent in sand and clay mixture soils
C. deep soils not absorbing drain field effluent
D. both A and B are correct

33. Of the following pesticides found in water sources, the most toxic to man are:

A. arsenicals
B. 2,4-D compounds
C. botanicals
D. organophosphorous pesticides

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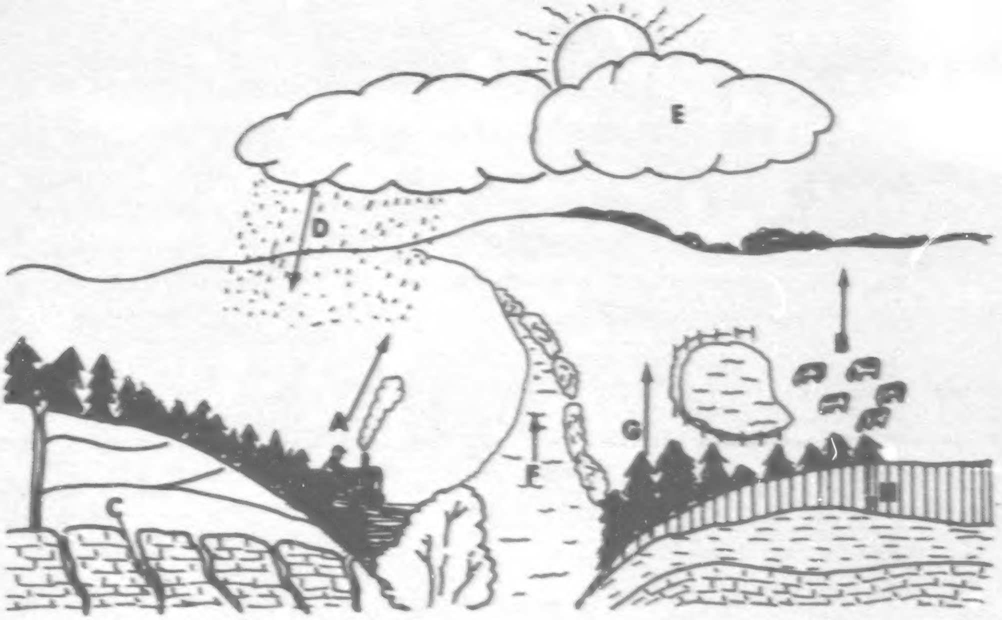


Indicate beside the following terms the corresponding letter of the correct process that is occuring:

34. Infiltration ________________
35. Condensation ________________
36. Respiration ________________
37. Precipitation ________________
38. Combustion ________________
39. Percolation ________________
40. Transpiration ________________
41. Evaporation ________________

END OF TEST

TABLE: 6-13
AREA: 6-13
TEST NO.: ____
KUDER-RICHARDSON 20: ____
KUDER-RICHARDSON 21: ____

Item	Correct Option	Relative Diffi- culty	Phi Coeff- icient	Point Biserial Coefficient	Discrim- ination Index
1.	C				
2.	A				
3.	C				
4.	B				
5.	C				
6.	D				
7.	A				
8.	C				
9.	B				
10.	D				
11.	B				
12.	D				
13.	C				
14.	C				
15.	C				
16.	D				
17.	D				
18.	B				
19.	B				
20.	A				
21.	B				
22.	C				
23.	C				
24.	B				
25.	C				
26.	D				
27.	B				
28.	A				
29.	D				
30.	A				

TABLE: 6-13
AREA: 6-13
TEST NO.:

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
31.	D				
32.	A				
33.	D				
34.	A				
35.	A				
36.	A				
37.	A				
38.	A				
39.	A				
40.	A				
41.	A				
42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

AREA: AGRICULTURAL RESOURCES

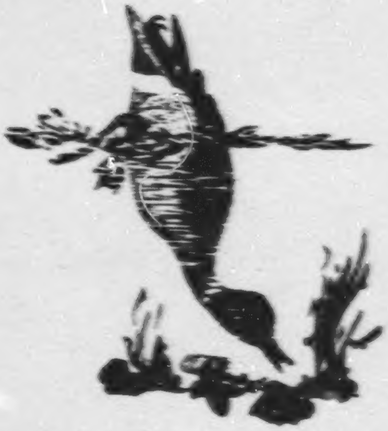
Unit: Wildlife Identification and Population Management

Student Performance Objectives

The student should be able to:

1. Using wildlife identification guides and/or references, identify the important bird and animal species in his region and classify them as game, non-game, nuisance or endangered species.
2. Using the necessary maps, aerial photographs and equipment, outline and implement plans for stimulating native and introduced game populations on a designated land area.
3. Using necessary resource material and equipment, implement a management plan for a wildlife refuge or sanctuary.
4. Identify the private, state and federal agencies in wildlife conservation and determine the services available through each.

Unit: Wildflife Identification and Population Management
(6-14)



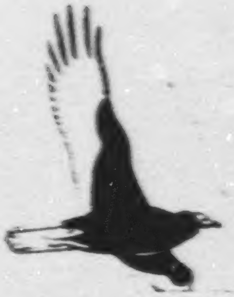
1. The duck in the above diagram would be classified as a:

   A. diving duck
   B. "dabbling" duck
   C. dunking duck
   D. bottom-feeding duck

GO TO NEXT PAGE

2. The species of duck in the diagram on the previous page is:

A. mallard
B. shoveler
C. pintail
D. common mengenser



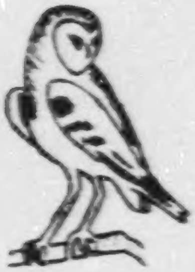
3. The species of bird diagrammed above is:

A. turkey vulture
B. condor
C. black vulture
D. bald eagle

GO TO NEXT PAGE

4. America's only very large brown bird with a white head and tail is the:

A. golden eagle
B. peregrine falcon
C. condor
D. bald eagle



5. The species of owl in the above diagram is:

A. screech owl
B. barred owl
C. great horned owl
D. barn owl

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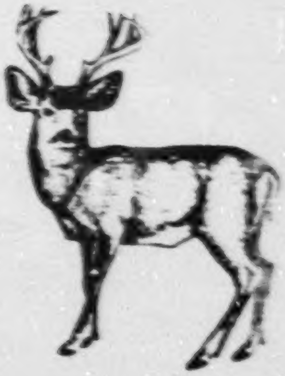

6. The species of animal in the above diagram is:

   A. pronghorn
   B. mule deer
   C. wapiti
   D. white-tailed deer

7. The crop land practice most beneficial to wildlife of those listed is:

   A. fall plowing
   B. early mowing of water courses and pastures
   C. liming and fertilizing
   D. burning of ditch banks

8. If it is found that the cottontail rabbit population in an area is experiencing high winter mortality due to predators and winter storms, the most logical recommendation would be to:

   A. provide more suitable winter cover
   B. make no changes as the conditions will probably not persist
   C. start a predator control campaign
   D. both A and C are correct

9. The limit that a unit of land has as to the number and variety of plants and animals it can support is called its:

   A. ecological limitation
   B. population density
   C. composition
   D. carrying capacity

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10. Successful seeding of an area to grass mixtures or food plants requires all of the following except:

    A. removal of plant competitors
    B. intensive liming and fertilization
    C. planting seed at proper depth
    D. selection of the appropriate plant species according to climatic and soil conditions

11. Refuges have generally met with greatest success for protecting:

    A. migratory water fowl
    B. pheasants
    C. white tail deer
    D. predatory animals

12. Wildlife habitat improvement programs should:

    A. introduce new plant species when possible
    B. be evaluated at intervals to determine if objectives are being met
    C. include vegetation manipulation which results in squares or strips of improved cover
    D. both A and C are correct

13. One of the most recommended perennial plants used in planting for wildlife cover is:

    A. sorghum
    B. millet
    C. sericea lespedeza
    D. alfalfa

14. Of the following wildlife organizations or agencies, the one that is most closely associated with improving water fowl is:

    A. The National Wildlife Federation
    B. The Wildlife Society
    C. The National Audubon Society
    D. Ducks Unlimited

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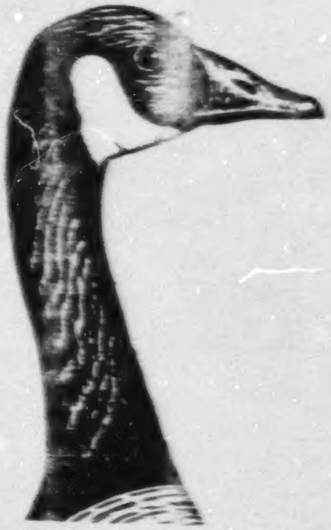
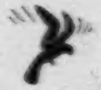


15. The species of water fowl in the above diagram is:

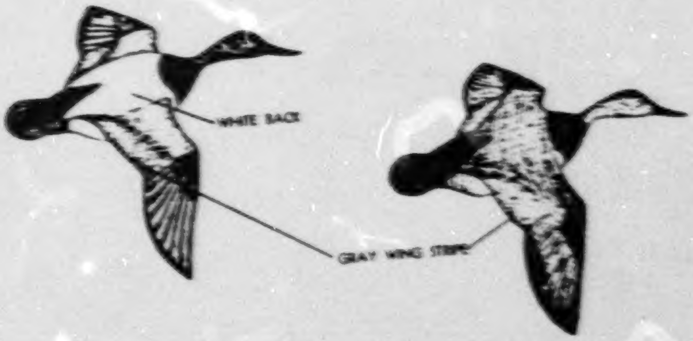
    A. mallard
    B. common goldeneye
    C. white-fronted goose
    D. Canada goose



16. The profile of the hawk in the above diagram would indicate that it is a(n):

    A. red-tailed hawk
    B. sparrow hawk
    C. osprey
    D. red-tailed hawk

GO TO NEXT PAGE



17. The species of duck in the above diagram is:

    A. mallard
    B. pintail
    C. canvasback
    D. common menganser

18. The only American fur-bearing mammal with a vertically flattened tail is the:

    A. muskrat
    B. beaver
    C. raccoon
    D. opossum

19. As a practical game management technique, predator control:

    A. is seldom effective
    B. effectively increases game populations
    C. is not economical
    D. both A and C are correct

20. Controlled burning is a wildlife management technique most assoicated with:

    A. ruffed grouse
    B. ringed-neck pheasants
    C. quail
    D. none of the above

GO TO NEXT PAGE

21. Wildlife classified as predators:

    A. are generally destructive animals
    B. have the potential of exterminating a prey species
    C. have a great effect on the number of prey species in an area
    D. should be controlled only when any increases in game populations will be utilized by man for food or recreation

22. Of the following methods of increasing wildlife populations, the one that would be considered a natural method is:

    A. restocking areas
    B. introducing exotic game species
    C. controlling predators
    D. improving habitat conditions

23. The most efficient and successful wildlife habitat management techniques are those which:

    A. make major changes in overall land management plan
    B. are aimed at improving one selected wildlife species
    C. make only minor changes in the overall land management plan
    D. are used in conjunction with intensive artificial restocking of wildlife

24. The most successful method of improving wetlands for wildlife is:

    A. controlling water levels
    B. planting food patches
    C. providing nesting boxes
    D. preventing hunting

25. One of the most important principles in providing wildlife habitat is to:

    A. include food supplying plants
    B. be sure water is located nearby
    C. increase habitat diversity when possible
    D. always include nesting cover

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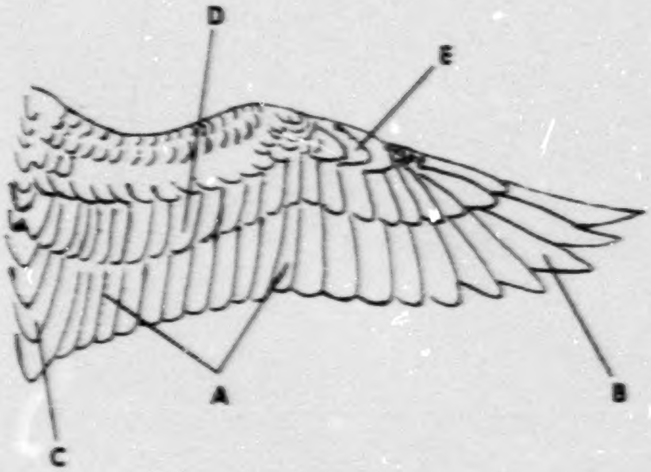
26. Ducks that take to the air by running or pattering along the surface of the water are species that are classified as:

A. diving ducks
B. "dabbling" ducks
C. surface-feeding ducks
D. both B and C are correct



Match the following terms with the appropriate letter from the above diagram of a duck's wing:

27. spurious wing _______

28. secondaries _______

29. greater coverts _______

30. primaries _______

GO TO NEXT PAGE

31. The woodland practice most beneficial to wildlife in small woodlands is:

A. grazing with livestock
B. selective cutting
C. eliminating woodland borders
D. clear cutting

32. The phenomenon of an abundance of wildlife located where different environmental types come together such as forests and cropland is referred to as:

A. edge effect
B. environmental effect
C. ecological effect
D. ecological limitation

33. Improving the browse for wildlife in an area means to:

A. seed the area in grass mixtures
B. improve the protective cover
C. increase the shrubs and trees whose leaves and twigs are used for food
D. increase the number of trees and shrubs which produce mast and fruits

34. Artificial stocking of birds and animals reared in game farms:

A. greatly increases wildlife populations for many years
B. is generally a costly and inefficient method of providing hunting
C. is most successful if hunting of the species is delayed for at least two years
D. both A and C are correct

35. The most critical season for wildlife in relation to availability of food and adequate shelter is:

A. summer
B. early autumn
C. mid-winter
D. early spring

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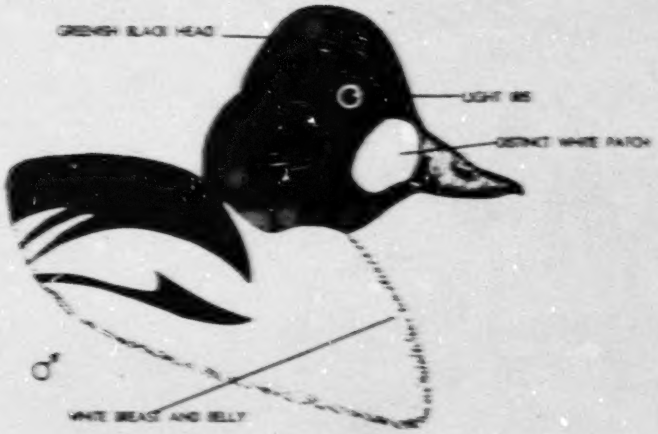
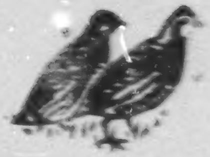


36. The species of duck in the above diagram is:

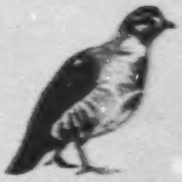
A. mallard
B. common menganser
C. common golden eye
D. ruddy duck

GO TO NEXT PAGE

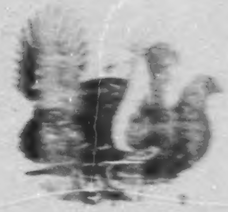
A.



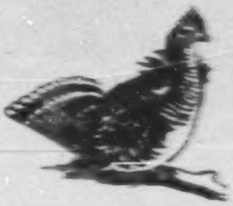
C.



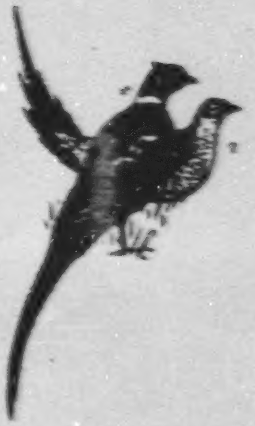
E.



B.



D.



From the above diagrams select the correct game birds listed below:

37. pheasant ________

38. ruffed grouse ________

39. partridge ________

40. bob white quail ________

END OF TEST

TABLE: 6-14
AREA: 6-14
TEST NO.:
KUDER-RICHARDSON 20:
KUDER-RICHARDSON 21:

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	B				
2.	A				
3.	A				
4.	D				
5.	D				
6.	B				
7.	C				
8.	A				
9.	D				
10.	B				
11.	A				
12.	B				
13.	C				
14.	D				
15.	D				
16.	B				
17.	C				
18.	A				
19.	D				
20.	C				
21.	D				
22.	D				
23.	C				
24.	A				
25.	C				
26.	A				
27.	E				
28.	A				
29.	D				
30.	B				

TABLE: 6-14
AREA: 6-14
TEST NO.:

Item	Correct Option	Relative Diffi- culty	Phi Coeff- icient	Point Biserial Coefficient	Discrim- ination Index
31.	B				
32.	A				
33.	C				
34.	B				
35.	D				
36.	C				
37.	D				
38.	B				
39.	C				
40.	A				
41.					
42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

AREA: AGRICULTURAL RESOURCES

Unit: Soil Fertility Management

Student Performance Objectives

The student should be able to:

1. Take soil samples representative of an area, correctly complete the soil data forms, and submit them for laboratory analysis so that the test results will accurately reflect the fertility conditions of the soil.

2. Using soil samples and a pH testing kit, test soil for acidity or alkalinity with accuracy of ± .5 pH and recommend proper soil additives to correct the pH level to meet plant needs.

3. When given soil test results, interpret the test data and make recommendations for necessary applications of lime, fertilizer, and micronutrients so as to obtain maximum production from a land area.

4. When given the type of individual ingredients to be used, calculate the amounts of nitrogen, phosphate and potash to blend to obtain a specified analysis in a dry bulk amount of fertilizer within ± 1%.

5. When given a specified land area, crop, and soil test data, apply the required amounts of lime, fertilizer, micronutrients, and organic matter in a manner which will meet the recommendations.

AREA: AGRICULTURAL RESOURCES

Unit: Soil Fertility Management
(6-16)

1. Of the following soil properties, those of greatest importance when determining the yield potential of a field are:

A. surface texture and subsoil pH
B. soil color and number
C. slope and available water
D. both A and C are correct
E. all of the above are correct

2. Which of the following plant nutrient or nutrients can be "built up" in the soil from one year to the next by heavy application?

A. nitrogen and phosphorus
B. nitrogen and potassium
C. phosphorus and potassium
D. only nitrogen

3. A fertilizer material with the analysis of 4-16-8 has:

A. 16 pounds of nitrogen in each bag
B. 16% of the fertilizer material is available phosphate
C. 16% potassium in each 100 pound bag
D. 4 times as much potassium as it does nitrogen

4. In order to get a representative soil sample, soil from any unusual areas of the field (such as dead furrows, old manure and lime piles) should:

A. be included in the sample in as nearly the same proportion as these unusual areas are represented in the total field
B. not be included in the sample at all
C. be sampled more heavily than usual areas because they need special attention
D. be mixed with soil from other areas after both have been aired dry

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5. Materials such as ground limestone provides calcium to plants as well as:

A. increase harmful concentrations of aluminum manganese and iron
B. lower the pH level of alkaline (sweet) soils
C. increase the pH level of acid soils
D. result in poorer soil structure and tilth

6. A fertilizer with the analysis of 4-16-8 has a major nutrient ratio of:

A. 1:2:1
B. 0:4:2
C. 2:8:4
D. 1:4:2

7. When planning the sampling procedure for a field, recommended guidelines would suggest:

A. taking 15 or more samples from each major area which differs in crop growth, soil color or past management
B. take one sample from each major area (as defined in "a") and mix together for one over all sample
C. where row crops are planted, take the samples in the crop row from about 15% of the rows
D. take 15 or more samples in the rows of row crops at the plow depth level

8. A soil test recommendation states the following additions of fertilizer be applied per acre for maintenance fertility: 85 pounds of nitrogen, 40 pounds of phosphorus, and 40 pounds of potassium. A 10-10-10 grade fertilizer is used to apply the total phosphorus and potassium. How much urea (45-0-0) would have to be added yet to bring the nitrogen application up to recommendation?

A. 40 pounds
B. 45 pounds
C. 90 pounds
D. 100 pounds

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9. If a soil test indicates a need for 32 pounds of phosphate, this could be supplied by applying:

A. 200 pounds of 8-8-16
B. 200 pounds of 4-16-8
C. 400 pounds of 8-16-16
D. 100 pounds of 0-16-16

10. When preparing soil samples for processing by the laboratory, 15 soil cores taken from one major area should:

A. be packaged into 15 separate mailers
B. mixed with distilled water and mailed in plastic mailers
C. be air dried and mixed together into a composite before being placed in a mailer
D. be dried in hot oven to make sure all disease organisms are killed before processing

11. The chemical symbol P_2O_5 refers to the more common names of:

A. phosphate
B. potash
C. potassium
D. both B and C are correct

12. The approximate amount of soil which is usually adequate for a laboratory analysis of nutrient levels of one major soil area is:

A. 1/2-1 pint
B. 1 quart
C. 1 quart to 1 gallon
D. 1 cubic foot

13. The soil that is most likely to respond with greatest crop increases by adding fertilizer is one which has:

A. a high magnesium level
B. a low pH
C. a low fertility level
D. very low levels of calcium

GO TO NEXT PAGE

14. When collecting a soil sample to determine the need for fertilizer, the best tool to use is a:

A. hoe
B. spade
C. auger
D. probe

15. The pH of the soil refers to:

A. the degree of acidity of the soil
B. the concentration of hydrogen ions in the soil solution
C. hydrolisis of water in the soil
D. the ratio of calcium to sulfur in the soil

16. When using lime on a soil to correct acidity, a primary consideration should be the affect the lime will have on:

A. the change in soil structure and drainage
B. the availability of fertilizer nutrients
C. soil microorganisms and insects
D. the effectiveness of pesticides applied to the soil

17. Which of the following would be used to raise soil pH?

A. calcium carbonate
B. aluminum sulfate
C. fertilizer
D. iron sulfate

18. Which soil component has the greatest ability to hold nutrients?

A. sand
B. silt
C. clay
D. gravel

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19. In a 50 pound bag of fertilizer having an analysis of 15-10-5, how many pounds of phosphorus are present?

A. 15
B. 10
C. 5
D. 20

20. To add a supply of sulfur and calcium to the soil but not significantly change the pH, one would add:

A. dolomitic limestone
B. gypsum
C. calacitic limestone
D. flowers of sulfur

21. Phosphorus contributes greatly to:

A. stalk strength
B. root development
C. vegetative growth
D. flowering

22. How many pounds of actual nitrogen are contained in a 50 pound bag of 10-6-4 fertilizer?

A. 6 pounds
B. 5 pounds
C. 10 pounds
D. 20 pounds

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A. N. PROGRESSIVE

LIME AND FERTILIZER RECOMMENDATIONS

YOUR SAMPLE ID	YEAR	CROP	YIELD GOAL	LIME T/A	NITROGEN N LB/A	PHOSPHATE P2O5 LB/A	POTASH K2O LB/A	COMMENTS SEE BELOW
	LAST	ALFALFA						
[illegible]	1973	CORN	130BU/A	0.0	60	60	20	1
	1974	SOYBEANS	45BU/A		---	45	25	
	1975	CORN	130BU/A		160	60	20	
	LAST	CORN						
[illegible]	1973	MEADOW SEEDING		0.0	20	140	40	2
	1974	MEADOW	4.0T/A		75	50	190	3
	1975	MEADOW	4.0T/A		75	50	190	4
	LAST	BLUEGRASS PASTURE						
[illegible]	1973	BLUEGRASS PASTURE	2.0T/A	2.0	120	0	30	5
	1974	ALFALFA(ESPR SEEDING)	2.0T/A		10	25	190	
	1975	ALFALFA	5.0T/A		---	40	260	

COMMENTS:

1	MG MAY BE DEFICIENT. SEE AGR GUIDE FOR RECOMMENDATIONS. CONFIRM BY PLANT ANALYSIS.
2	CORRECTIVE P AND OR CORRECTIVE K IS INCLUDED IN FIRST APPLICATION.
3,4	IF 50 PERCENT OR MORE LEGUME OMIT N. IF 20 PERCENT OR LESS APPLY 50 LBS MORE N.
3,4,5	SPLIT NITROGEN INTO SPRING AND FALL APPLICATIONS.

A. N. PROGRESSIVE
R. D. 1
PLEASANT VALLEY [illegible]
[illegible] FRANKLIN [illegible] [illegible] [illegible] [illegible]

A-1 LIME & FERT. CO.
145 RAILROAD AVE
[illegible] [illegible]
[illegible] [illegible] [illegible] 1

ANALYTICAL RESULTS

[illegible]	[illegible]	[illegible]	[illegible]	10			6.9	62	28	642	7040	980	25	76	16	2.2	25	31
[illegible]	[illegible]	[illegible]	[illegible]	8			6.6	67	26	320	6000	1380	27	61	23	1.5		
[illegible]	[illegible]	[illegible]	[illegible]	7	75	3	6.1	67	60	233	1760	475	18	62	19	2.6		

THE OHIO STATE UNIVERSITY SOIL TESTING LABORATORY
COOPERATIVE EXTENSION SERVICE, 1885 NEIL AVENUE — COLUMBUS, OHIO 43210

COUNTY EXTENSION AGENT COPY

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23. When interpreting the lime test index as indicated on the preceding page of laboratory recommendations, the lower the index:

A. the lower the lime requirement
B. the higher the soil fertility
C. the higher the calcium-magnesium ratio
D. the higher the lime requirement

24. Soil pH on the laboratory recommendation refers to:

A. the active acidity or alkalinity in the soil
B. the lime requirements of the indicated crop and yield goal
C. the cation exchange capacity of the soil
D. the total acidity in the soil

25. In the lime and fertilizer recommendation, 2 ton of lime/acre is required to raise the pH of the mineral soil in field 18 NE1 to:

A. 4.7
B. 5.0 - 5.5
C. 5.5 - 6.0
D. 6.5

26. To meet the fertilizer recommendation for field 19 NW1 for the 1975 corn crop and assuming a silt loam soil the farmer could:

A. make a fall application of 300 lb/A of anhydrous ammonia (33-0-0) and apply 200 lb/A of 6-24-12 at planting
B. make a fall application of 300 lb/A of anhydrous ammonia (33-0-0) and apply 400 lb. of 5-20-20 at planting
C. make a fall application of 300 lb/A of urea (45-0-0) and apply 300 lb/A of 10-20-10 at planting
D. make a fall application of 150 lbs/A urea (45-0-0) and apply 300 lb/A of 10-20-10 at planting

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27. To meet the fertilizer recommendation for field 18 NE1 for the 1975 alfalfa crop, the farmer could apply:

    A. 3 applications of a special blend of 0-10-60 analysis at the rate of 145 lb/acre per application
    B. 3 applications of 5-20-20 analysis at the rate of 210 lb/acre per application
    C. 2 applications of 0-20-20 analysis at the rate of 150 lb/acre per application
    D. 2 applications of a special blend of 0-20-40 analysis at the rate of 200 lb/acre per application

28. Of the following soil nutrients, those which are classified as micronutrients include:

    A. potassium, calcium, boron
    B. potassium and phosphorous
    C. magnesium and boron
    D. zinc and nitrogen

29. For most crops grown in organic soils, the pH reading should be:

    A. 4.7 - 5.0
    B. 5.0 - 5.5
    C. 5.5 - 6.0
    D. 6.7 - 7.0

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30. Major advantages of plowing down nitrogen fertilizers in the fall include:

A. fertilizer can be applied when requirements are low
B. fertilizer may be cheaper in the fall
C. less nitrogen is lost due to denitrification
D. both A and B are correct
E. all of the above are correct

31. Top dressing meadows or pastures with phosphorous or potassium may be accomplished:

A. at any time during the year
B. only in the spring
C. on frozen ground if heavy rains do not occur after application
D. both A and C are correct

32. Of the following methods of fertilizer application, the one usually not recommended for crops because of the large amounts needed is:

A. broadcast
B. top dressing
C. side dressing
D. foliar application

33. Of the following factors, those used in determining the amount of lime to apply to increase the soil pH to a specified level are:

A. total soil acidity and plowing depth
B. previous lime history and crops to be grown
C. the type of liming material used and soil texture
D. all of the above are correct

END OF TEST

TABLE: 6-16
AREA: 6-16
TEST NO.:
KUDER-RICHARDSON 20:
KUDER-RICHARDSON 21:

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D				
2.	C				
3.	B				
4.	B				
5.	C				
6.	D				
7.	A				
8.	D				
9.	B				
10.	C				
11.	A				
12.	A				
13.	C				
14.	D				
15.	B				
16.	B				
17.	A				
18.	C				
19.	C				
20.	B				
21.	B				
22.	B				
23.	D				
24.	A				
25.	D				
26.	C				
27.	A				
28.	C				
29.	B				
30.	D				

TABLE: 6-16
AREA: 6-16
TEST NO.:

Item	Correct Option	Relative Diffi- culty	Phi Coeff- icient	Point Biserial Coefficient	Discrim- ination Index
31.	D				
32.	D				
33.	D				
34.					
35.					
36.					
37.					
38.					
39.					
40.					
41.					
42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

AREA: FORESTRY

Unit: Chain Saw Maintenance

Student Performance Objectives

The student should be able to:

1. When using operators' manuals, common chain saws and necessary tools, identify the different types of carburetor air cleaners commonly found on chain saw engines and clean and service them according to the manufacturer's specifications.

2. When given a chain saw with a maladjusted carburetor, adjust the idle speed and high speed carburetor adjustments which will result in maximum engine efficiency when cutting.

3. When given carbon-fouled or worn spark plugs from chain saws, service the old plug or select a new one to replace it according to the manufacturer's specifications.

4. When using appropriate files, file holder, filing vise and depth gauge, sharpen saw chains of the type common to the area with accuracy required to make straight, efficient cuts.

5. Remove broken links or damaged saw chain parts and replace them using a punch, hammer and file according to manufacturer's specifications.

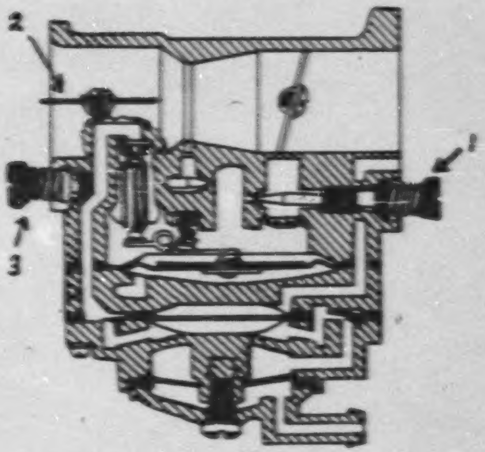
6. When given a chain saw with a damaged or worn chain, select, lubricate, adjust and break in the new saw chain according to manufacturer's specifications.

7. Troubleshoot problems concerning the saw chain, guide bar and/or sprocket and make needed replacement or repairs on chain saw with worn or malfunctioning parts according to the manufacturer's specifications.

8. When given a chain saw with a worn or broken starter rope, repair and/or replace the starter rope according to instructions in the operator's manual.

AREA: FORESTRY

Unit: Chain Saw Maintenance
(7-1)



1. In the above diagram, number 1 is called the:

   A. idle needle
   B. main needle
   C. high speed screw
   D. throttle adjustment

2. In the above diagram, number 2 is called the:

   A. throttle shutter
   B. choke shutter
   C. diaphragm
   D. metering shutter

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3. In the diagram on the preceding page, number 3 is called the:

   A. main needle
   B. high-speed-load adjustment
   C. power adjusting needle
   D. all of the above

4. Most chain saws have a(n):

   A. oil-bath type air cleaner
   B. dry-filter type air cleaner
   C. oiled-filter type air cleaner
   D. none of the above

5. A carburetor with an adjustable manual choke valve is:

   A. adjusted by adjusting the control linkage
   B. adjusted only when the engine is cold
   C. adjusted by adjusting the main needle
   D. both a and c are correct

6. A chain saw engine that is backfiring is indicating that:

   A. the fuel mixture is too lean
   B. the high-speed adjustment should be turned in a clockwise direction
   C. the exhaust valves are badly worn
   D. the idle speed adjustment should be turned in a clockwise direction

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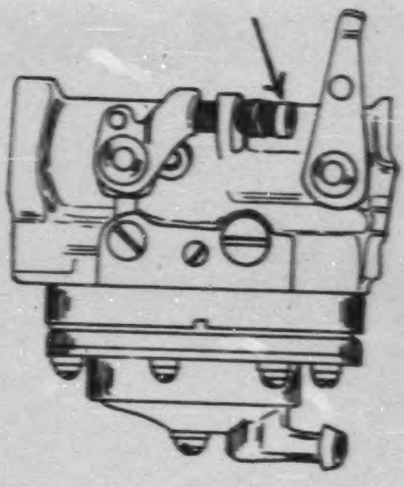

7. The arrow in the above diagram is pointing to the:

A. high-speed adjustment
B. choke valve linkage control
C. idling valve
D. idle-speed stop screw

8. Care must be taken to select the correct replacement spark plug because:

A. a cold plug under heavy load conditions will overheat quicker
B. hot plugs will stay cleaner under light load conditions
C. a cold plug will foul with carbon under heavy load conditions
D. both a and c are correct

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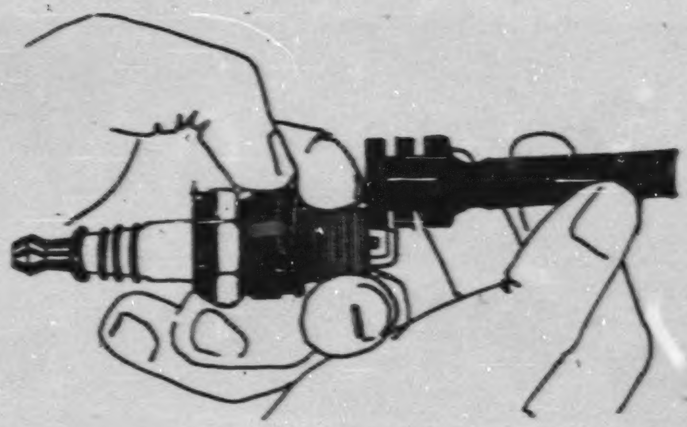

9. In this diagram, the person is using a(n):

   A. flat feeler gauge
   B. wire feeler gauge
   C. gap setter
   D. ignition file

10. When filing the cutter on a saw chain:

   A. file from the inside to the outside of the cutter
   B. fuel on both the forward and back stroke
   C. hold the file so as to make a 45° top plate angle
   D. both a and c are correct

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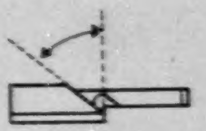
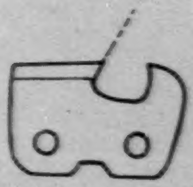
11. Of the following diagrams, which illustrates the correctly filed cutter?

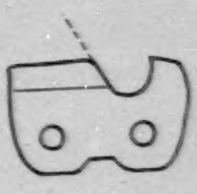
A.



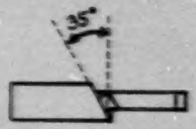
C.

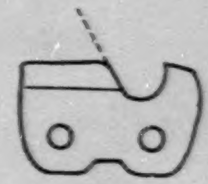


B.



D.





12. In the above diagram, the saw chain part is called a:

A. preset left hand cutter
B. drive link
C. right hand cutter
D. guard link

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13. When installing a new cutter on a saw chain:

A. the new cutter should be filed to match worn cutters
B. the dimple on the tie strap should face out
C. the drive link and tie straps should also be replaced
D. both a and b

14. The major cause of all saw chain problems is:

A. improper sharpening of cutters
B. improper selection of replacement chains
C. forgetting to oil the chain
D. loose chain tension

15. When installing a saw chain the bar tip:

A. should be held down while tightening the bar nuts
B. should be held level with the saw while tightening the bar nuts
C. should not be held while tightening the bar nuts
D. should be held up while tightening the bar nuts

16. If you fail to service the air cleaner on a chain saw engine:

A. some dirt will enter the combustion chamber and be blown out through the muffler
B. the dirt will build up and choke the engine
C. dirt will pass into the engine and mix with the fuel mixture
D. all of the above

17. When servicing dry-filter type air cleaners:

A. the filter element should always be replaced
B. petroleum solvents should be used to clean the filter
C. Naptha should be used to clean the filter
D. the filter should be tapped on a hard surface or cleaned with compressed air

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18. On most carburetors the idle-mixture adjustment is:

A. located nearer the engine
B. located farthest from the engine
C. located on the bottom of the carburetor
D. both a and c are correct

19. When making initial carburetor adjustments:

A. each adjusting needle should first be turned all the way out
B. close each adjusting needle one turn from the completely out position
C. the idle-speed stop screw should be adjusted first
D. turn each of the adjusting needles open approximately one turn from the closed position

20. High-speed carburetor adjustments must be made when the engine:

A. is cold
B. is running at low speeds
C. is at normal operating temperature
D. is operating under very heavy loads

21. Most chain saws use plugs with:

A. longer reaches
B. shorter reaches
C. average length reach

22. Of the following equipment, the item that is not used for filing saw chains is a:

A. filing vise
B. jointer
C. rat tail file
D. file holder

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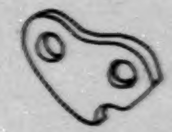
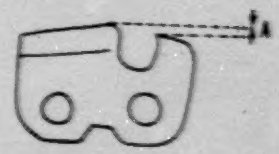


23. The saw chain part in the above diagram is:

A. a tie strap
B. never sharpened
C. a side plate
D. a drive link



24. The distance indicated by "A" in the above diagram:

A. varies with chain pitch
B. is the cutting groove
C. is the cutting tang
D. both a and b are correct

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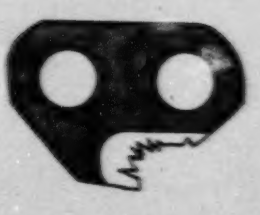
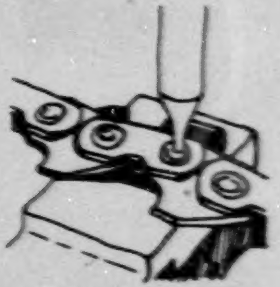


25. The probable cause of the drive link damage in the above diagram is:

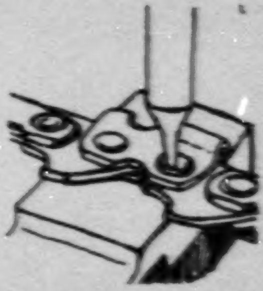
A. bottoming in the sprocket
B. misaligned rim type sprocket
C. striking side of bar entry
D. loose chain jumping bar

26. Which diagram illustrates the correct procedure for punching out rivets in a damaged saw chain part?

A.



B.



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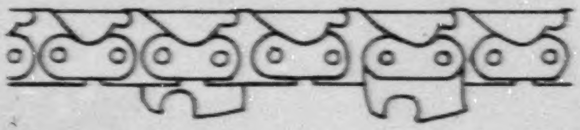
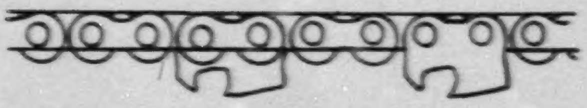
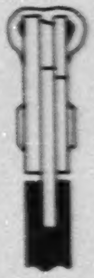
27. Which diagram of a saw chain illustrates correct tension?

A.



B.





28. In the above cross-section diagram of a guide groove and chain:

A. the chain is fitting properly in the groove
B. the guide groove is too deep
C. the guide groove is too shallow
D. the tang is too long

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29. To prevent fraying of a new starter rope:

    A. singe the end of the rope with a match flame
    B. tie knots at each end of the rope
    C. use only nylon ropes
    D. dip the ends of the rope in paraffin

30. The usual cause of a chain cutting crooked is:

    A. a worn bar
    B. loose chain tension
    C. tight joints
    D. a warped bar

31. By turning the high-speed load adjustment on the carburetor in a clockwise manner, the engine when running under full load will:

    A. give off black smoke from the exhaust
    B. lose power
    C. run faster
    D. develop lower exhaust temperatures

32. If a spark plug has a weak spark and the observed spark between the spark-plug wire and the cylinder head is blue-orange color:

    A. the ignition system is faulty
    B. the spark plug is faulty
    C. the spark plug wire should be replaced
    D. both a and c are correct

33. If it is necessary to wind the recoil spring before installing a new rope on a chain saw:

    A. the starter spring should be wound as far as it will wind
    B. the starter spring should be wound completely and then released one complete turn
    C. the starter spring should be wound one complete turn
    D. the starter spring should be wound half-way

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34. If upon removing the starter as a self contained unit from the chain saw, the knot of the rope is visible:

A. the starter will need to be disassembled to replace the rope
B. the starter will need to be rewound
C. the rope can be replaced without disassembling the starter
D. both a and b are correct

35. Chain saw sprockets:

A. can usually be repaired
B. should be replaced every time a new chain is installed
C. have little effect upon the life of the saw chain
D. both a and c are correct

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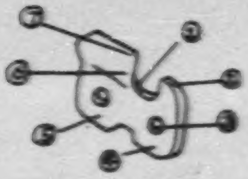

Indicate beside each term the corresponding number of the cutter part in the diagram above

____ 36. Toe

____ 37. Gullet

____ 38. Top Plate

____ 39. Depth Gauge

____ 40. Heel

END OF TEST

TABLE: 7-1 S
AREA: Forestry
TEST NO.: 7-1
KUDER-RICHARDSON 20: .517
KUDER-RICHARDSON 21: .436
N(tests) = 36

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	A	.556	-.353	-.129	-22.7
2.	B	.583	.383	.180	24.5
3.	A	.917	.324	.304	9.1
4.	B	.333	.218	.277	13.6
5.	A	.972	-.353	-.228	-10.0
6.	A	.639	.673	.143	34.5
7.	D	.444	.836	.306	51.8
8.	B	.917	.000	-.063	00.0
9.	C	.306	-.110	-.091	-6.4
10.	A	.639	.673	.227	34.5
11.	D	.611	.760	.342	43.6
12.	C	.583	.790	.330	44.5
13.	D	.806	-.031	.108	-0.9
14.	D	.639	-.078	-.040	-4.5
15.	D	.667	.279	.254	16.4
16.	D	.333	.047	.033	2.7
17.	D	.444	.637	.237	32.7
18.	A	.806	.413	.296	26.4
19.	D	.389	.972	.574	70.0
20.	C	.694	.760	.443	43.6
21.	B	.500	.368	.196	23.6
22.	C	.694	.110	.120	6.4
23.	D	.500	.649	.250	33.6
24.	A	.861	-.031	.066	-1.8
25.	D	.417	.063	.081	3.6
26.	B	.556	.861	.402	53.6
27.	B	.444	.353	.237	22.7
28.	C	.528	.844	.393	52.7
29.	A	.417	.649	.260	33.6
30.	A	.889	.187	.127	8.2

TABLE: 7-1 S
AREA: Forestry
TEST NO.: 7-1

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
31.	B	.611	.368	.300	23.6
32.	B	.639	.861	.396	53.6
33.	B	.583	.760	.317	43.6
34.	C	.611	.249	.036	15.5
35.	B	.611	.279	.175	16.4
36.	A	.528	.637	.380	32.7
37.	A	.361	.368	.237	21.8
38.	A	.194	.673	.320	30.9
39.	A	.806	.707	.450	35.5
40.	A	.444	.836	.401	51.8
41.					
42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

TABLE: 7-1 A
AREA: Forestry
TEST NO.: 7-1
KUDER-RICHARDSON 20: .571
KUDER-RICHARDSON 21: .464
N(tests) = 28

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	A	.464	-.203	.072	-12.5
2.	B	.464	.649	.257	33.3
3.	A	.643	.141	.166	8.3
4.	B	.357	.649	.429	33.3
5.	A	.786	.790	.317	33.3
6.	A	.714	-.353	.056	-20.8
7.	D	.143	.861	.480	50.0
8.	B	.821	.790	.214	33.3
9.	C	.357	.353	.166	20.8
10.	A	.821	.625	.257	16.7
11.	D	.679	.729	.319	37.5
12.	C	.536	.884	.433	58.3
13.	D	.714	-.649	-.130	-33.3
14.	D	.571	-.264	-.051	-16.7
15.	D	.357	.861	.534	50.0
16.	D	.464	.884	.408	58.3
17.	D	.321	.861	.346	50.0
18.	A	.857	.625	.192	16.7
19.	D	.500	.000	-.076	00.0
20.	C	.464	.264	.122	16.7
21.	B	.500	.397	.344	25.0
22.	C	.893	-.368	-.156	-12.5
23.	D	.321	.930	.508	62.5
24.	A	.929	-.368	-.147	-12.5
25.	D	.286	.353	.093	20.8
26.	B	.679	.383	.157	20.8
27.	B	.321	-.383	-.067	-20.8
28.	C	.607	-.063	-.064	-4.2
29.	A	.393	.780	.133	45.8
30.	A	.893	.790	.224	33.3

TABLE: 7-1 A
AREA: Forestry
TEST NO.: 7-1

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
31.	B	.607	.999	.692	83.3
32.	B	.714	-.063	.074	-4.2
33.	B	.714	.729	.390	37.5
34.	C	.821	.383	.104	20.8
35.	B	.429	.930	.373	62.5
36.	A	.464	.999	.509	87.5
37.	A	.179	.861	.487	50.0
38.	A	.107	.368	.265	12.5
39.	A	.571	.999	.543	87.5
40.	A	.286	.861	.353	50.0
41.					
42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

AREA: FORESTRY

Unit: Establishing the Forest

Student Performance Objectives

The student should be able to:

1. Identify and explain at least eight benefits of forest resources to man.

2. When given a site to be established or re-established as a forest, develop a reforestation plan which should include the method to be used, the seedbed preparation required, the tree species, and the spacing between the trees.

3. When given a site and specific method of reforestation, prepare the seedbed in the prescribed manner.

4. When given a site and specific planting or seeding method, plant or seed the trees with less than 20% loss.

AREA: FORESTRY

Unit: Establishing the Forest
(7-3)

1. Of the following methods of reproducing a forest, the cheapest is:

   A. artificial seeding
   B. planting trees
   C. natural seeding
   D. seeding from airplanes

2. Transplant stock should be used in reforestration:

   A. in most planting situations
   B. where the survival of planted seedings is very poor
   C. when the least expensive planting stock is desired
   D. in very wet soils

3. Of the following timber harvesting methods, the one(s) which promote natural reforestation is (are):

   A. selective cutting
   B. clear cutting
   C. seed tree cutting
   D. all of the above

4. When killing woody plants under 4" in diameter at a tree planting site, the recommended herbicide to use is:

   A. a foliar herbicide
   B. a systemic herbicide
   C. malathion
   D. diazinon

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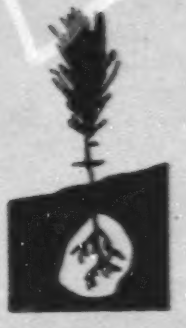
9

5. The most effective time to disk a refurestation site where natural seeding is expected is:

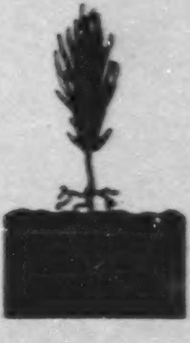
A. in the early spring
B. in the late autumn
C. midsummer
D. after seed fall

6. The fastest method of planting trees by hand is:

A. the bar-silt method using a planting bar
B. the dug-hole method
C. the grub-hoe-slit method
D. the side-hole method



1.



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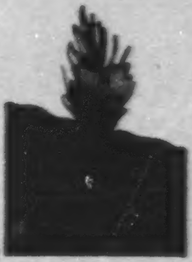

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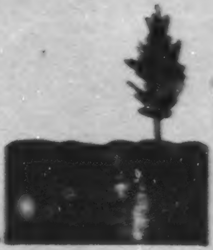

4.

7. In the above diagram, the correctly planted tree seedling is:

A. 1
B. 2
C. 3
D. 4

GO TO NEXT PAGE

8. The most important decision in artificially reproducing a stand of trees is:

   A. the method of reforestation to be used
   B. the seed bed preparation that is required
   C. selection of the tree species
   D. determining the spacing between the trees

9. Of the following factors which affect natural reforestation, the one that is least likely to influence its success is:

   A. a sufficient number of well located seed trees
   B. site conditions suitable for seed catch
   C. the wildlife in the area
   D. a good seed year

10. Artificial seeding of trees on a reforestation site:

    A. has a higher risk of failure than planting trees
    B. is not as dependent upon weather and soil conditions to be successful
    C. is usually more expensive than planting trees
    D. usually produces thinner stands than does planting of seedlings

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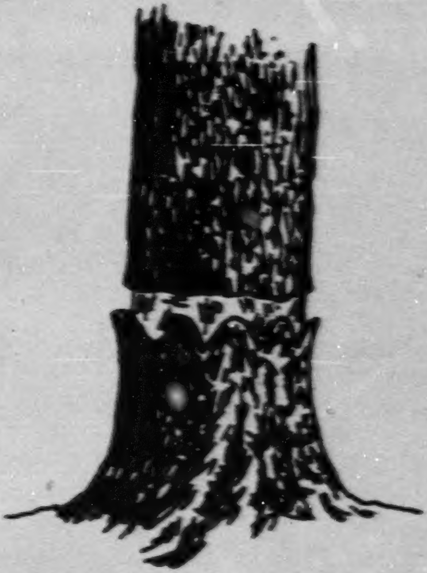

11. The tree in the above diagram has been:

    A. girdled
    B. frilled
    C. injected
    D. stripped

12. Fall planting of seedlings in northern climates is usually not recommended due to the problem of:

    A. wildlife feeding on the seedlings
    B. frost-heaving of the seedlings
    C. freezing of the seedlings
    D. ice and snow damage to the seedlings

13. Of the following factors, the one which least affects the life of tree seedlings before planting is:

    A. wind
    B. freezing
    C. sunlight
    D. lack of nutrition

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14. The greatest limitation of machine planting trees is:

    A. a higher percentage of the trees die
    B. the press wheels usually do not pack the soil tightly enough around the seedlings
    C. the planter will not work adequately on steep or rough ground
    D. the tree root systems are placed in unnatural positions

15. Of the following factors the one which would be least important in selecting the species of trees from those suited for the site is:

    A. the cost of establishment and management
    B. the rate of growth of the tree species
    C. value of the products of the trees
    D. the available markets for the tree species

16. In most situations, the spacing interval for planted trees will be:

    A. between 3 and 6 feet
    B. between 6 and 10 feet
    C. between 10 and 16 feet
    D. between 16 and 20 feet

17. Burning to help prepare the site to be planted or direct seeded to trees:

    A. has generally been found to be unsuccessful
    B. is not economical
    C. may be successful dependent upon the weather and fuel conditions
    D. both A and B are correct

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18. Girdling unwanted trees at a reforestation site is:

A. more effective than basal treatment
B. very efficient in terms of time and labor
C. not usually recommended as there are better alternatives
D. the least expensive method

19. Tree seedlings should be planted:

A. 1-3" deeper than they were at the nursery
B. 1-3" shallower than they were at the nursery
C. at the same depth as they were planted at the nursery
D. only after being root pruned

20. Planting of tree seedlings should always be completed:

A. after the last frost in the spring
B. before new growth begins in the spring
C. before midsummer
D. after new growth begins in the spring

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21. Tree seedlings that are marked 3-0:

A. have spent 3 years in the seedbed
B. have spent 3 years in the transplant bed
C. have at least 3 inches of taproot growth
D. would be undesirable to plant

22. Bare-root conifers have the greatest chances of survival when the tops of the planting stock are:

A. shorter than 4 inches
B. 4-12 inches high
C. over 1 foot high
D. over 18 inches high

23. Competition from unwanted trees under 4" in diameter and other vegetation on a planting site can usually be killed the easiest and cheapest by using:

A. bulldozers
B. a tractor and plow
C. herbicides
D. hand scalping at planting time

24. If planting stock cannot be planted for at least one week after arrival from the nursery, the trees should be:

A. kept moist by pouring water in the ends of the bundle
B. kept in a container with the roots in water
C. heeled-in
D. root pruned and placed in a container with the roots in water

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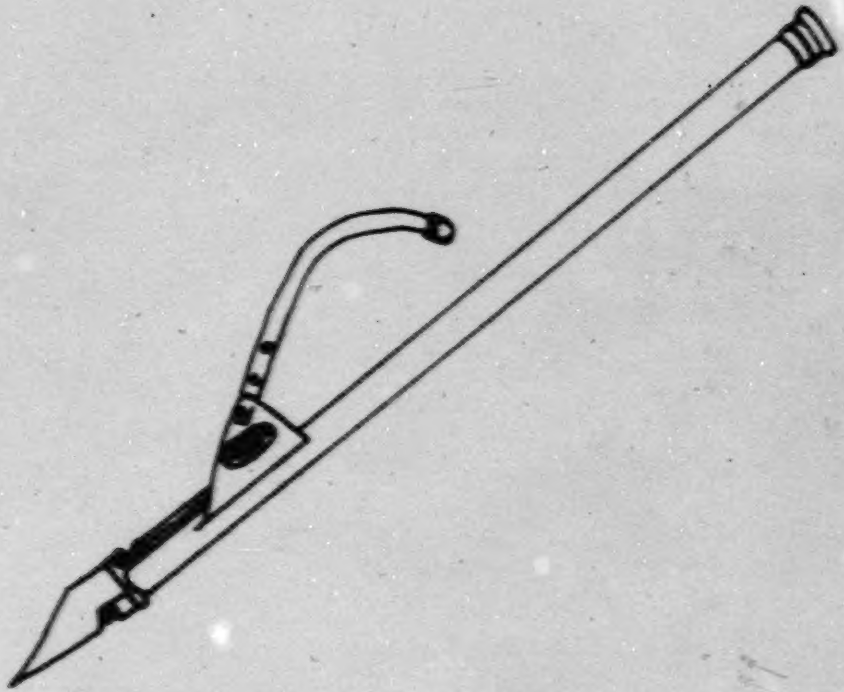


25. The tool in the above diagram which is often used in site preparation for tree planting or seeding is a:

A. tree injector
B. tree girdler
C. tree friller
D. tree implanter

GO TO NEXT PAGE

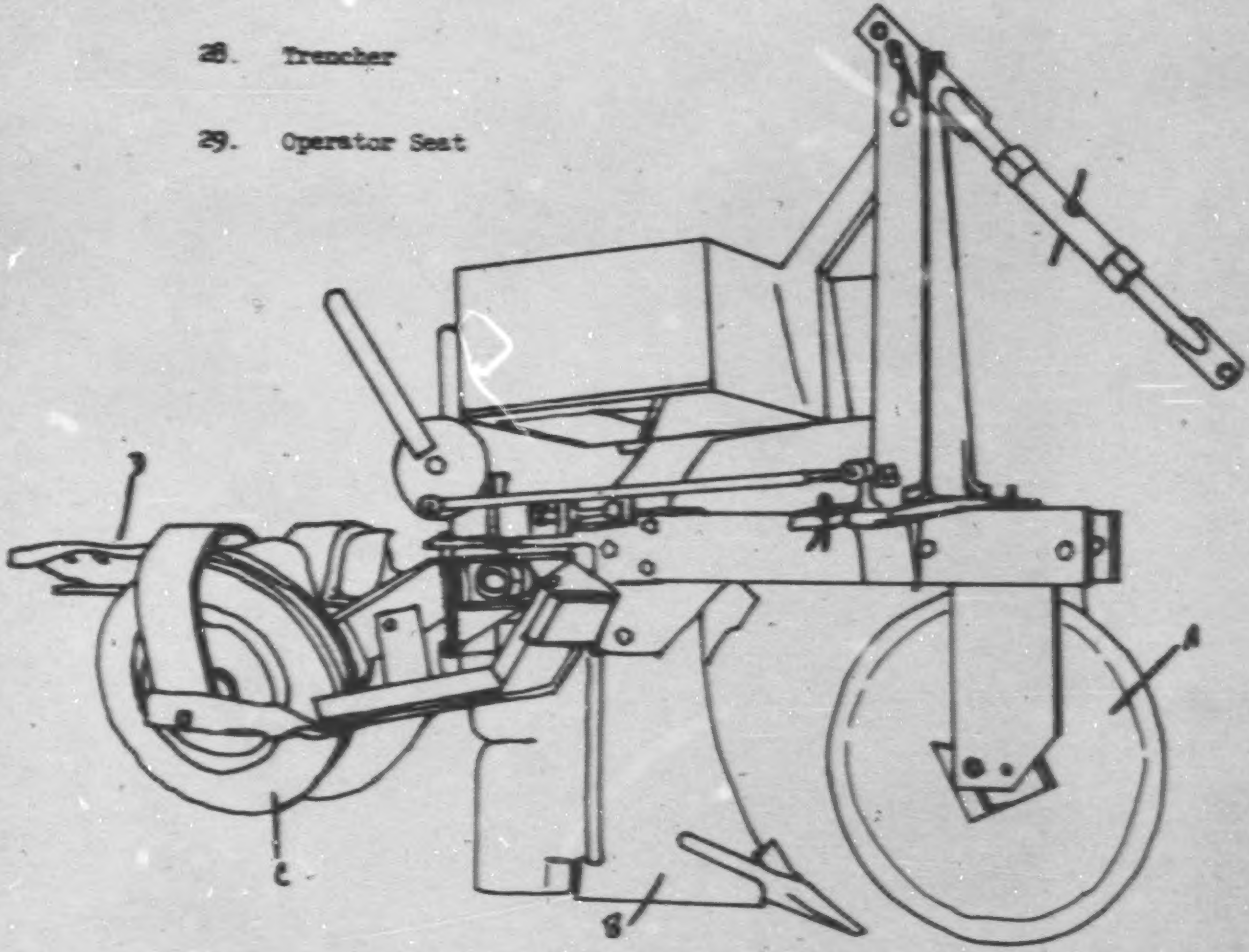
From the diagram below, indicate the letter of the tree seedling transplanter part which corresponds with the name listed below.

26. Packing Wheel

27. Coulter

28. Trencher

29. Operator Seat



END OF TEST

TABLE: 7-3 S
AREA: Forestry
TEST NO.: 7-3
KUDER-RICHARDSON 20: .567
KUDER-RICHARDSON 21: .377
N(tests) = 22

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.182	.454	.044	16.7
2.	B	.318	.000	-.167	00.0
3.	D	.955	.000	.109	00.0
4.	A	.773	.770	.302	33.3
5.	C	.909	.000	.064	00.0
6.	A	.318	.884	.440	50.0
7.	D	.136	.294	.351	16.7
8.	C	.591	.294	.250	16.7
9.	C	.591	.264	.086	16.7
10.	A	.591	.637	.223	33.3
11.	B	.909	.770	.298	33.3
12.	B	.682	.960	.543	66.7
13.	D	.773	.454	.142	16.7
14.	C	.273	.294	.148	16.7
15.	D	.864	.000	-.116	00.0
16.	B	.318	.827	.469	50.0
17.	C	.591	.264	.168	16.7
18.	C	.682	.884	.311	50.0
19.	C	.455	.000	.329	00.0
20.	B	.682	.661	.369	33.3
21.	A	.864	.454	.159	16.7
22.	B	.455	.637	.302	33.3
23.	C	.318	.960	.498	66.7
24.	C	.591	.941	.469	66.7
25.	A	.318	.960	.585	66.7
26.	C	.182	.294	.393	16.7
27.	A	.182	.294	.393	16.7
28.	B	.136	.884	.547	50.0
29.	D	.045	.454	.150	16.7
30.					

AREA: FORESTRY

Unit: Timber Management Practices

Student Performance Objectives

The student should be able to:

1. Prescribe for a specific forest product on a given plantation of any age the timing, method and intensity of the next weeding, thinning and pruning.
2. When given a forest area and timber stand improvement practices to be implemented, complete the prescribed practices with competence required to obtain the desirec results.
3. Identify and implement the different types of harvest cuttings that are used in even-aged and uneven-aged forests in his area with complete accuracy.
4. Identify the different government and professional forest management organizations and explain the services they provide forest landowners.

AREA: FORESTRY

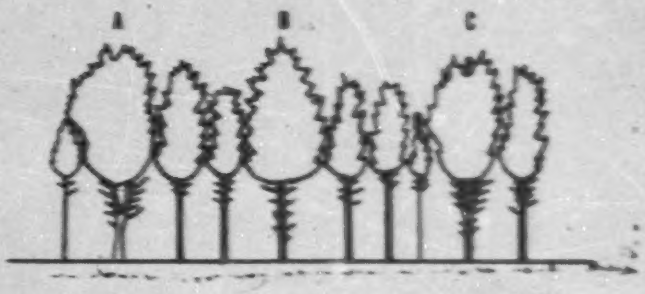
Unit: Timber Management Practices (7-4)

1. The Tree Crown classification which is characterized by trees receiving light from above but with little from the sides is:

   A. dominant
   B. codominant
   C. intermediate
   D. overtopped

2. Of the following factors, the least important when selecting trees to be left after a thinning cut is:

   A. the relative position and condition of the crown
   B. the health of the tree
   C. the condition and quality of the bole
   D. the DBH of the trees



3. In the above diagram, the trees which would be removed in a selection thinning are:

   A. A and B
   B. A,B, and C
   C. A only
   D. A,B,C, and D

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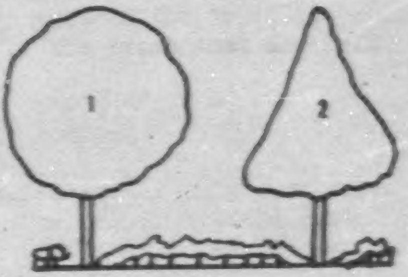
4. Artificial pruning of crop trees is often necessary because:

A. the initial planting of the trees is not dense enough
B. some species do not readily lose their lower branches
C. some trees will grow much faster after being prunned
D. both A and B are correct

5. Weeding and cleaning cuts are rarely made in tree stands that:

A. have been reproduced naturally
B. are pure stands
C. are even-aged
D. are primarily coniferous



6. In the above diagram, removal of trees 1 and 2 would be an example of a:

A. liberation cut
B. weeding cut
C. release cutting
D. both A and C are correct

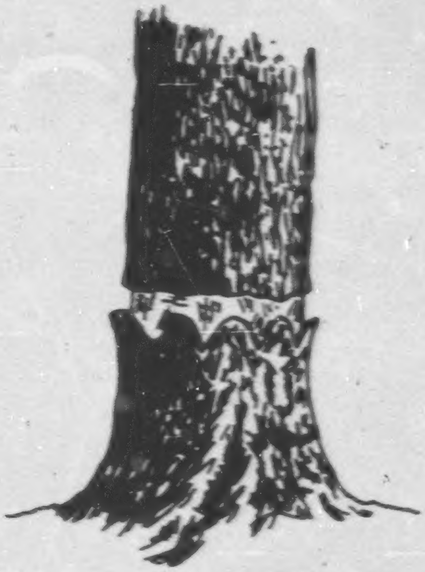
GO TO NEXT PAGE

7. Cutting made past the sapling stage for the purpose of improving the composition or quality of the timber stand are called:

   A. liberation cuttings
   B. weeding cuts
   C. cleaning cuts
   D. improvement cuttings

8. When thinning a timber stand, the trees that are to be removed:

   A. should be cut and left where they fall
   B. should be killed with herbicides
   C. should be removed when most economically advantageous
   D. both A and C are correct



9. The tree in the above diagram has been:

   A. girdled
   B. frilled
   C. injected
   D. stripped

GO TO NEXT PAGE

10. A common herbicide used in killing trees to release overtopped ones is:

    A. 2,4,5-T
    B. malathion
    C. parathion
    D. diethylstilbestrol

11. When clearcutting in a large forest, the size of the patches that are cut is usually governed by:

    A. the amount of erosion that will occur in the clearcut area
    B. the size of the forest
    C. the area that will be seeded naturally by surrounding trees
    D. the slope of the area

12. In selecting trees to leave in a seed-tree cutting, one important consideration is:

    A. the potential increase in value of the trees that are left
    B. the potential of the trees to protect the site from erosion
    C. the windfirmness of the trees to be left
    D. the value of the trees that are left

13. Diameter limit cutting:

    A. is not recommended as only poor trees are left in the stand
    B. may be recommended in a stand containing two distinct age classes
    C. is usually difficult to administer
    D. has the major advantage of releasing young, healthy trees

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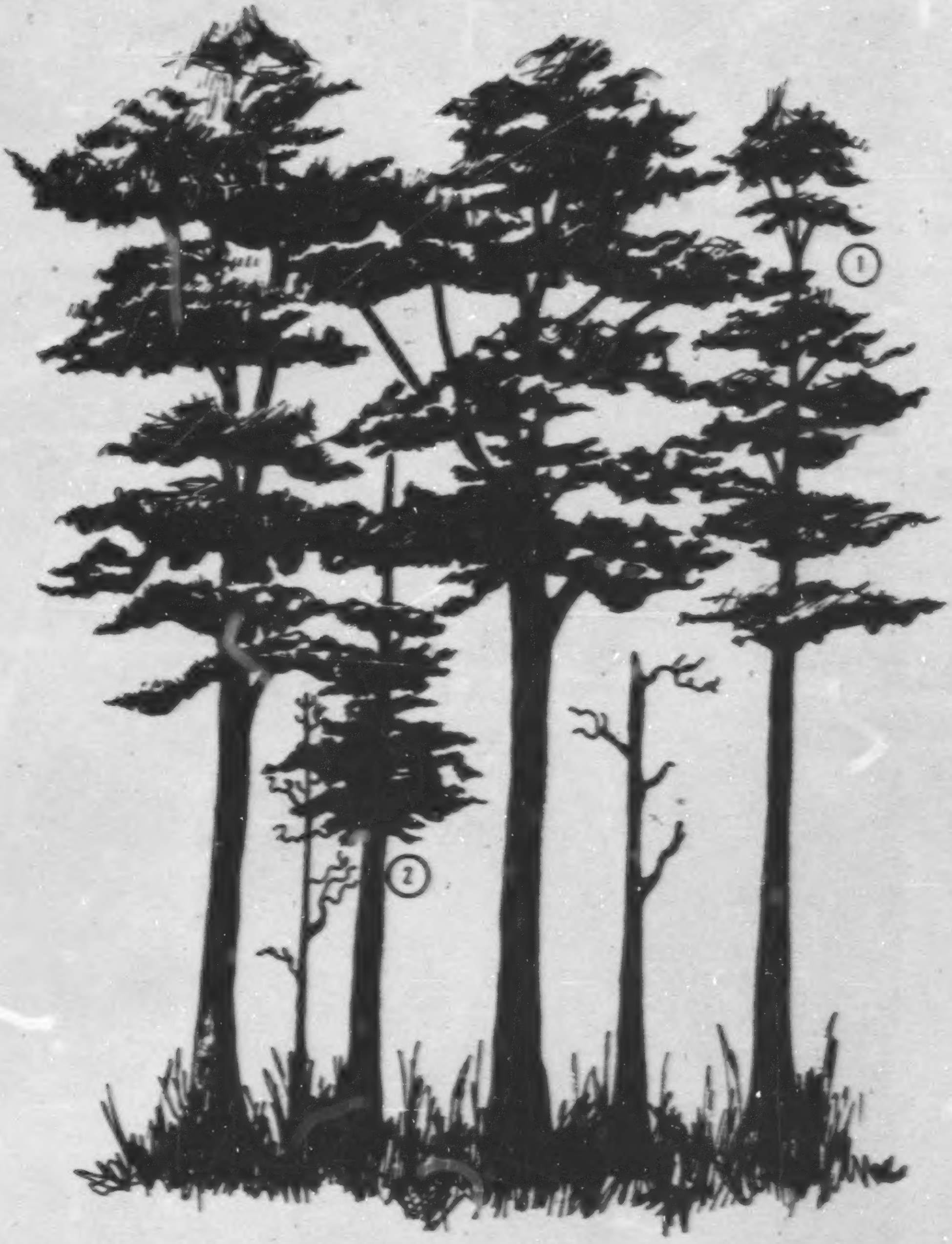

14. The tree indicated by number 1 in the above diagram would be classified as a(n):

A. dominant
B. codominant
C. intermediate
D. overtopped

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15. The tree indicated by number 2 in the above diagram would be classified as a(n):

A. dominant
B. codominant
C. intermediate
D. overtopped

16. The best indicator for determining when to apply the first thinning to a stand of potential crop trees is:

A. the live crown ratio (ratio of live crown to tree height)
B. the DBH of the trees
C. the relative percentage of shade tolerant tree species in the stand
D. the height of the dominant trees

17. The primary purpose of a thinning cut is to:

A. increase the total volume of wood which will be produced by the stand
B. obtain the highest net returns possible under the economic circumstances
C. remove undesirable weed tree species
D. prevent disease in the tree stand

18. Pruning of hardwoods should normally be accomplished

A. on slow growing trees
B. in the spring of the year
C. in conjunction with a thinning cut
D. both A and C are correct

19. Cleaning and weeding cuts are made when the trees are:

A. not past the sapling stage
B. between 8 and 12 inches DBH
C. over 12 inches DBH
D. at any age level

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20. A thinning in a timber stand should be planned when:

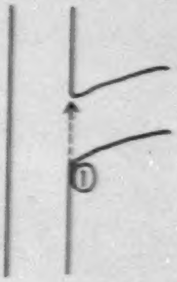
A. the length of the live crown is more than 30-40 percent of the total tree height
B. the average DBH reaches 12 inches
C. the length of the live crown is less than one-third the total tree height
D. the length of the live crown is more than 50 percent of the total tree height

21. In determining the timing and amount of thinning or release cuttings in a timber stand the most important factor to consider is:

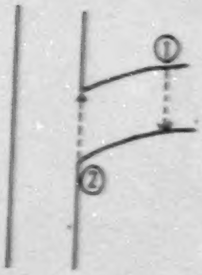
A. the economics of the operation
B. the age of the trees
C. the average height and DBH of the trees
D. the intended use of the forest

22. The best method of removing a large limb from a tree is indicated by:

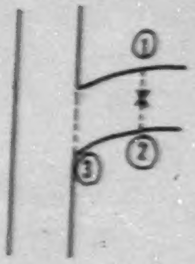
A.



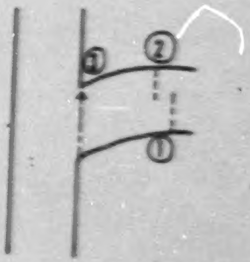
B.



C.



D.



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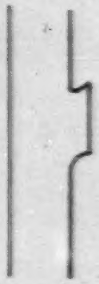
23. The greatest disadvantage of basal spraying of trees in a cleaning or weeding operation is that:

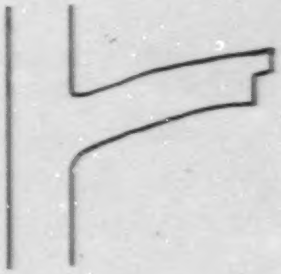
A. it is not as effective as other methods of killing trees
B. it is not as selective as other methods of killing trees
C. it is not a reliable method of killing trees
D. it is expensive

24. The diagram below which indicates a limb that has been properly pruned from a tree is:

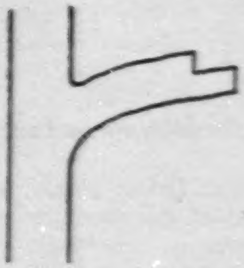
A.



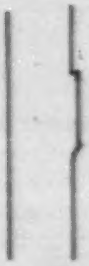
C.



B.



D.



25. Clearcutting a forest area will:

A. result in an uneven-aged stand
B. be most successful if some of the poorer trees are left to hold the soil
C. produce an even-aged stand in the area that is clearcut
D. always require some type of artificial reproduction method to be used

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26. Shelterwood cutting differs from seed-tree cutting in that:

A. more trees are left after the first cutting
B. more cuttings are usually made in the same stand
C. a shelterwood cutting will provide the site with a smaller erosion problem
D. all of the above are correct

27. Of the following factors, the one which is usually not used in selecting the trees to remove in a selection cut is:

A. age or size
B. quality
C. vigor
D. crown class

28. The best indicator for determining when to apply subsequent thinning cuts to stand of potential crop trees after the first thinning has been made is:

A. the rate of growth of the crop trees
B. the average DBH of the crop trees
C. the relative proportion of dominant trees to codominate trees
D. the average DBH of the dominant trees

29. In general the most costly silvicultural operation is:

A. a thinning cut
B. a release cutting
C. pruning
D. an improvement cutting

30. Of the following methods, the one which would not be used as a method of cleaning or weeding a young stand of desirable trees is:

A. aerial spraying with selective herbicides
B. basal spraying
C. felling undesirable trees
D. girdling

31. Pruning should be done:

A. when the entire first log can be pruned
B. in several steps
C. to a height of no more than 12 feet on most trees
D. on every tree in the stand

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32. In making a weeding or cleaning cut, the undesirable trees are usually:

A. cut and left where they fall
B. used for pulpwood
C. frilled
D. girdled

33. Salvage cuttings are made to:

A. remove undesirable trees that are overtopping others
B. remove trees that have been or are in danger of being killed
C. minimize financial losses
D. both B and C are correct

34. When clearcutting, the trees that are left should be:

A. saplings of the desired species
B. of sufficient size to reseed the area
C. of sufficient size to prevent erosion
D. no trees should be left standing

35. In a shelterwood cutting, the shelterwood trees are harvested after:

A. the young seedlings have emerged
B. the reproduced trees have reached sapling stage
C. the shelterwood trees have stopped growing rapidly
D. the shelterwood trees are hindering the growth of the reproduced trees

36. Of the following agencies and organizations, which assist landowners in managing forests. The one which would be described as a Federal Agency is the:

A. American Forestry Association
B. Southern Forest Institute
C. Forest Products Research Society
D. Soil Conservation Service

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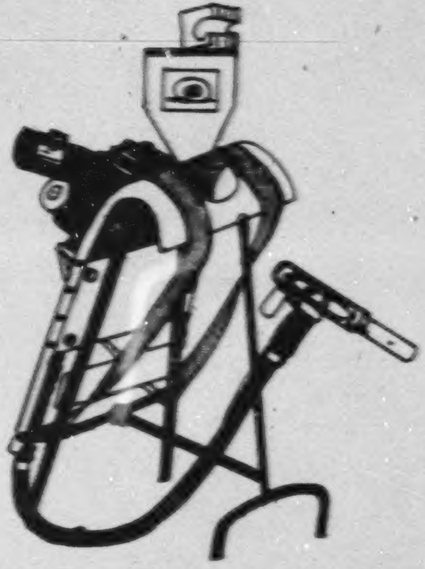


37. The tool in the above diagram is used to:

A. inject trees with herbicides
B. mark trees
C. frill trees
D. girdle trees

END OF TEST

TABLE: 7-4 S
AREA: Forestry
TEST NO.: 7-4
KUDER-RICHARDSON 20: .093
KUDER-RICHARDSON 21: .007
N(tests) = 20

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	B	.850	-.836	-.375	-40.0
2.	D	.600	.790	.424	46.7
3.	B	.600	.790	.424	46.7
4.	D	.650	.869	.528	50.0
5.	B	.750	.440	.032	16.7
6.	D	.400	.156	.097	10.0
7.	D	.600	.411	.163	26.7
8.	C	.550	.110	.108	6.7
9.	B	.950	.440	.129	16.7
10.	A	.600	.951	.424	66.7
11.	C	.750	-.063	-.011	-3.3
12.	C	.800	-.063	-.036	-3.3
13.	B	.600	.413	.052	30.0
14.	B	.650	.233	.147	13.3
15.	D	.900	.750	.309	33.3
16.	A	.700	.156	-.068	10.0
17.	B	.750	-.661	-.263	-20.0
18.	C	.900	.000	-.055	00.0
19.	A	.900	.440	.249	16.7
20.	C	.600	.156	.089	10.0
21.	A	.750	-.770	-.221	-43.3
22.	D	.800	-.063	-.036	-3.3
23.	D	.650	.233	.261	13.3
24.	D	.500	.996	.564	83.3
25.	C	.800	.869	.373	50.0
26.	D	.500	.790	.346	46.7
27.	D	.800	-.397	.009	-23.3
28.	A	.750	.951	.620	66.7
29.	C	.800	.000	.009	00.0
30.	D	.700	.413	.171	30.0

TABLE: 7-4 S
AREA: Forestry
TEST NO.: 7-4

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
31.	B	.600	.411	.386	26.7
32.	A	.900	.000	.067	00.0
33.	D	.700	.413	.369	30.0
34.	D	.900	.000	.006	00.0
35.	D	.700	.869	.568	50.0
36.	D	.750	.233	.200	13.3
37.	D	.850	-.063	-.120	-3.3
38.					
39.					
40.					
41.					
42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

AREA: FORESTRY

Unit: Felling, Limbing and Bucking Trees with the Chain Saw

Student Performance Objectives

The student should be able to:

1. Given a specific area of timber to be harvested and considering the conditions which exist, plan and describe the procedures to follow in felling trees which would:

   A. provide maximum safety to operators,
   B. provide minimum damage to equipment,
   C. provide minimum damage to trees being felled and other trees, and
   D. save the maximum time and labor in the logging operation.

2. Given a commonly used chain saw, ax and wedges, safely fell trees in the desired direction.

3. Given a commonly used chain saw, safely limb trees on level or sloping terrain to the satisfaction of the instructor or employer.

4. Given a commonly used chain saw and other necessary equipment, demonstrate the skills necessary in bucking trees to obtain correct lengths for the intended use of logs or bolts.

AREA: FORESTRY

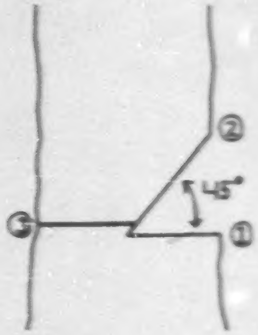
Unit: Felling, Limbing, and Bucking Trees with the Chain Saw
(7-6)

1. The highest percentage of chain saw injuries are to:

   A. the wrist, hand and fingers
   B. shoulders and arms
   C. right side of the body
   D. left side of the body

2. The correct way to fell a straight tree 20" in diameter is indicated by:

A.



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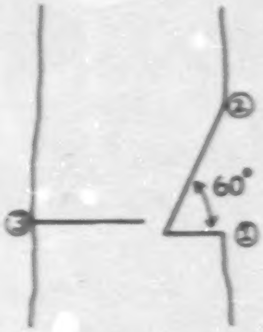

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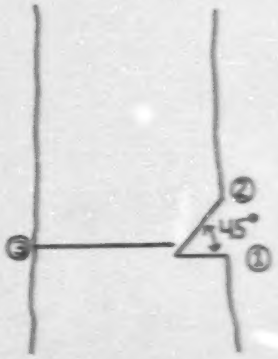

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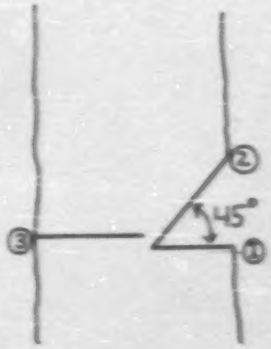

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3. If a tree has not fallen after making the back cut the feller should:

   A. completely cut through to the notch
   B. make a larger notch
   C. use a sledge and wedges to make it fall
   D. both A and C are correct

4. If a tree has lodged in another tree, the method that should not be used to dislodge it is to:

   A. pull it out with a tractor
   B. fell another tree across it
   C. fell the tree it is lodged in
   D. cut the tree loose from the stump and roll it out with a peavey

5. When limbing felled trees, the saw operator should:

   A. start at the top of the tree and limb to the base
   B. leave 6" to one foot of limb on the log to keep it from rolling
   C. stand on the side opposite the side of the log being limbed if possible
   D. stand on the log being limbed when necessary

6. To prevent pinching of the saw while limbing or bucking, the saw operator should:

   A. never cut a log that is suspended at both ends
   B. always use an undercut
   C. insert a wedge in the cut before it closes on the saw
   D. both B and C are correct

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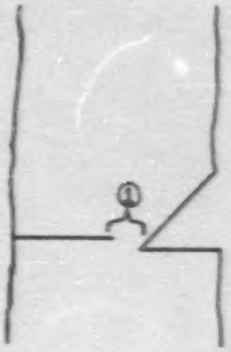

7. When felling a straight tree as indicated in the diagram above, the distance (1) should be approximately:

   A. 1/2 inch
   B. 2 inches
   C. 3-4 inches
   D. 5 inches

8. A leaning tree usually can not be felled in a direction other than the direction of the lean if the lean is more than:

   A. 5°
   B. 10°
   C. 15°
   D. 18°

9. A general rule for determining correct stump height is:

   A. the stump should not be over six inches high on the uphill side
   B. the stump should not be over twelve inches high on the uphill side
   C. cut the stump at the most convenient height
   D. the stump should not be over 24 inches high on the uphill side

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10. When bucking felled trees, the saw operator should:

A. stand to one side of the saw, not behind it
B. stand on the downhill side of the log
C. undercut the log when possible
D. both A and C are correct

11. As the tree is falling, the feller should:

A. select an escape route
B. set the saw beside the tree and run
C. alert anyone within hearing that the tree is falling
D. be alert for falling limbs or the tree kicking back

12. Of the following factors, the one which would be least important when determining where a tree should be felled is:

A. the lean of the tree
B. the amount of defects in the tree
C. obstacles beneath the tree
D. DBH of the tree

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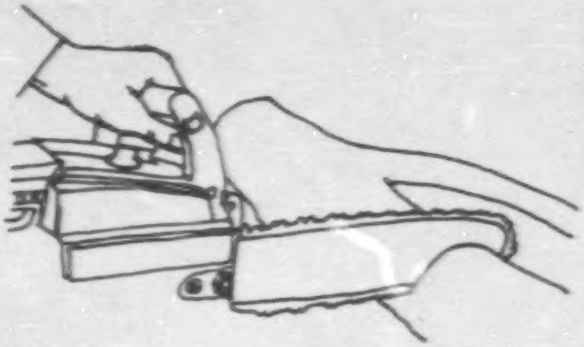
13. Which diagram indicates the correct way to hold the upper grip of the saw?

A.



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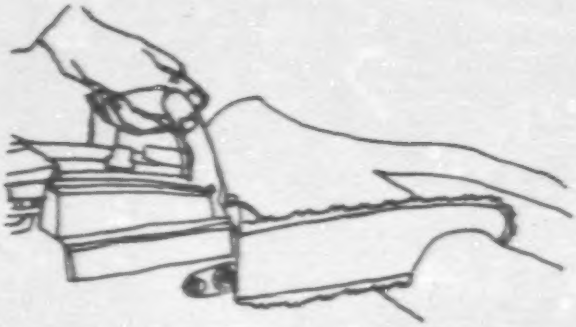

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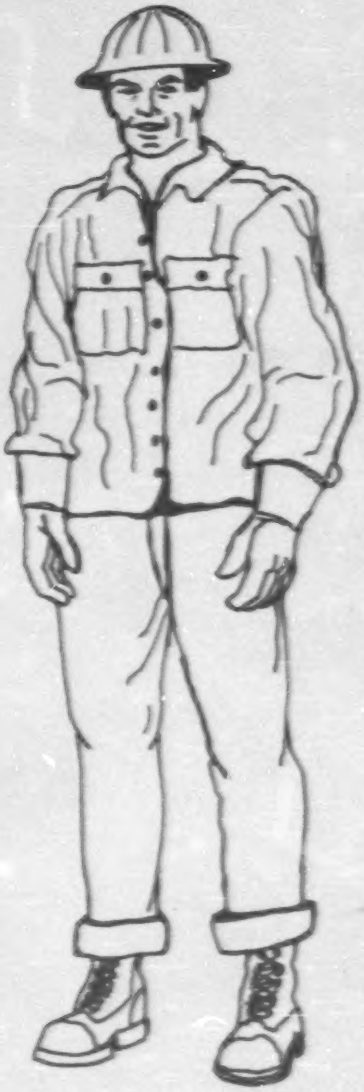

14. To be dressed properly, the forester in the above diagram:

A. should not be wearing loose clothing
B. should be wearing a scarf to protect his neck
C. should not have cuffs in his pants
D. both A and C are correct

END OF TEST

TABLE: 7-6 S
AREA: Forestry
TEST NO.: 7-6
KUDER-RICHARDSON 20: .269
KUDER-RICHARDSON 21: .126
N(tests) = 100

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D	.730	.946	.513	65.6
2.	D	.350	.294	.189	17.9
3.	C	.510	.780	.380	45.2
4.	C	.610	.990	.567	78.6
5.	C	.430	.876	.391	55.3
6.	C	.890	-.078	-.076	-3.3
7.	B	.490	.685	.313	36.9
8.	A	.810	.353	.169	18.4
9.	B	.850	-.078	-.041	-3.3
10.	A	.780	.411	.229	22.8
11.	D	.540	.884	.396	57.9
12.	D	.570	.818	.454	49.6
13.	A	.270	.836	.417	47.7
14.	D	.380	.411	.200	26.3
15.					
16.					
17.					
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AREA: FORESTRY

Unit: Christmas Tree Production

Student Performance Objectives

The student should be able to:

1. Evaluate the market potential and economics of Christmas tree production in his area.
2. Select appropriate sites for Christmas tree production considering soil requirements, topography and preparation requirements.
3. Lay out a Christmas tree plantation in a manner which will facilitate management.
4. Identify the different species of Christmas trees in his region and indicate their characteristics and market potential
5. Using needed site preparation and planting tools and equipment, prepare a site and plant Christmas tree seedling with an acceptable survival rate for his area.
6. Develop and implement a cultural plan for a Christmas tree plantation which will result in vigorous, well-formed trees.
7. Develop and implement a protection plan for a Christmas tree plantation to include fire protection, protection from insects and diseases and protection from animals.
8. Develop and implement a harvesting plan for a Christmas tree plantation including timing, equipment and storage.
9. Develop and implement a marketing plan for a Christmas tree enterprise including developing outlets, making sales contacts and grading.

Unit: Christmas Tree Production
(7-8)

1. The Christmas tree industry:

   A. is highly seasonal
   B. has high uniformity in sale price and profits in different parts of the country
   C. market is dictated by consumer preference
   D. both A and C are correct

2. The major objectives of site preparation procedures on land to be planted to Christmas trees should be:

   A. to improve soil fertility
   B. to improve soil structure through plowing or disking
   C. to remove or control competing vegetation
   D. to improve soil pH levels

3. If a producer is expecting to produce high quality 6-8 foot trees, the minimum recommended tree spacing would be:

   A. 4 foot
   B. 5 foot
   C. 8 foot
   D. 10 foot

4. Of the following factors concerning Christmas tree planting stock, the least important to consider when selecting planting stock is:

   A. age
   B. root system
   C. balance between root system and crown
   D. size

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5. Of the following factors, the one which least affects the life of tree seedlings between the nursery and planting is:

A. wind
B. freezing
C. sunlight
D. lack of nutrition

6. Tree seedlings should be planted:

A. 1-3 inches deeper than they were at the nursery
B. 1-3 inches shallower than they were at the nursery
C. at the same depth or slightly deeper than they were at the nursery
D. only after being root pruned

7. The greatest limitation of machine planting trees is:

A. a higher percentage of the trees die
B. the press wheels usually do not pack the soil tightly enough around the seedlings
C. the planter will not work adequately on steep or rough ground
D. the tree root systems are placed in unnatural positions

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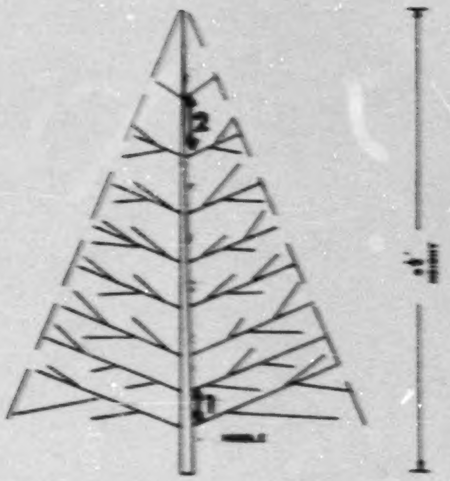

8. The distance indicated by number 1 in the above diagram should be:

   A. 2-4 inches
   B. 6-8 inches
   C. 9-12 inches
   D. 13-16 inches

9. The distance indicated by number 2 in the above diagram should be:

   A. 4-6 inches
   B. 6-8 inches
   C. 10-12 inches
   D. 14-16 inches

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10. A terminal whorl should include:

    A. 2-5 lateral branches
    B. 6-10 lateral branches
    C. 12-14 lateral branches
    D. 15 or more lateral branches

11. The basic purpose for side shearing Christmas trees is to:

    A. shape the tree
    B. decrease foliage density
    C. control bagworms
    D. both A and B are correct

12. Green colorant sprays applied in the field should be applied:

    A. in late spring
    B. one week before harvesting
    C. in mid-summer
    D. in August or early fall

13. Bagworms attacking Christmas trees are controlled by spraying them in the:

    A. egg stage
    B. larvae stage
    C. pupa stage
    D. adult stage

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14. Of the following factors, the one which is usually not used in determining Christmas tree grades is:

    A. foliage
    B. density
    C. taper
    D. color

15. A Christmas tree with light density, candlestick taper, and 2 adjacent faces free from damage would grade:

    A. U.S. choice
    B. U.S. standard
    C. U.S. premium
    D. number 1

16. The size of the area to be devoted to Christmas trees by a commercial or non-commercial farmer should be determined by:

    A. labor available
    B. productivity of the land
    C. marketing objectives
    D. both A and C are correct

17. When laying out a Christmas tree plantation, the most important factor(s) to consider is(are):

    A. accessibility
    B. amount of slope
    C. wind direction
    D. both A and B are correct

18. The most-used Christmas tree species in the United States is:

    A. Douglas-fir
    B. Red pine
    C. Scotch pine
    D. Norway spruce

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19. Pine tree seedlings that are marked 3-0:

A. have spent 3 years in the seedbed
B. have spent 3 years in the transplant bed
C. have at least 3 inches of taproot growth
D. would be undesirable to plant as Christmas trees

20. If planting stock cannot be planted for at least one week after arrival from the nursery, the trees should be:

A. placed in cold storage
B. placed in a container with water covering the roots
C. heeled-in
D. both A and C are correct

21. Planting of Christmas tree seedlings should be completed:

A. after the last frost in the spring
B. before new growth begins in the spring
C. before midsummer
D. after new growth begins in the spring

22. When killing woody plants under 4" in diameter on a Christmas tree planting site, the recommended type of herbicide to use is:

A. a foliar herbicide
B. a systemic herbicide
C. malathion base herbicide
D. diazinon base herbicide

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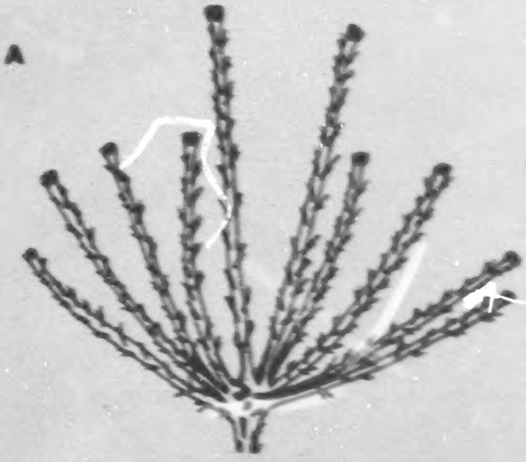
23. Maximum benefit of a weed and grass control program is obtained if the spraying is accomplished in:

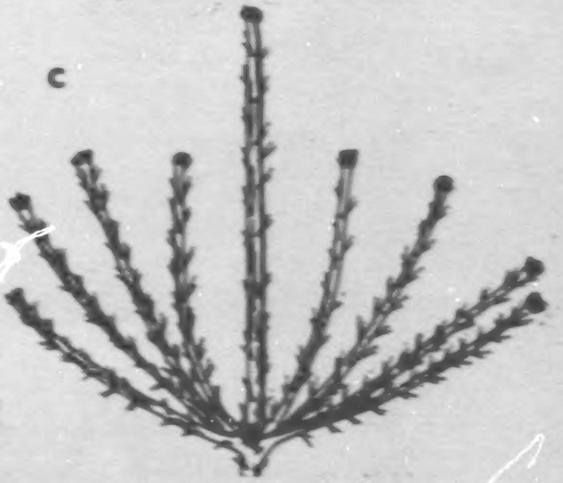
A. early spring
B. early summer
C. late summer
D. autumn

24. In the following diagrams of terminal whorls, the most desirable is:

A



C



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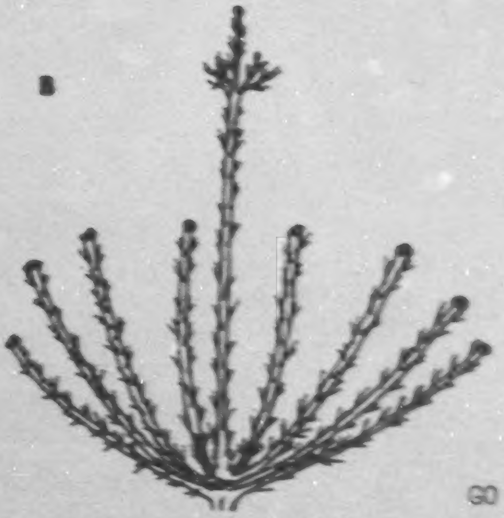

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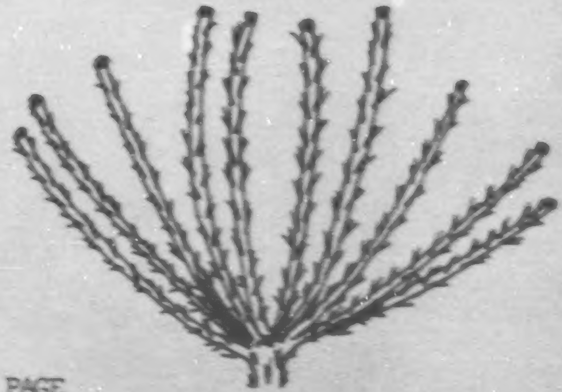

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25. When pruning the terminal whorl, which of the following rules should be followed?

    A. the cut regulating the terminal shoot length should be made at a 45 - 60° angle with the shoot
    B. a terminal whorl should include 2 - 5 lateral branches
    C. the lateral branches should be cut to a length 1/4 - 1/3 the length of the terminal shoot
    D. both A and C are correct

26. When harvesting Christmas trees, the butts should be cut:

    A. 4 inches from ground level
    B. with a square cut
    C. with a 45° cut
    D. both A and B are correct

27. Of the following insects which infect Christmas tree plantations, the one that is not a defoliator (needle eater) is:

    A. bag worms
    B. saw fly
    C. pine spittlebug
    D. pine tip moth

28. U.S. Premium Grade Christmas trees must have:

    A. 1 face free from damage
    B. 2 faces free from damage
    C. 3 faces free from damage
    D. 4 faces free from damage

29. The type of land use system characterized by removing all Christmas trees from an area at the same time and then replanting is:

    A. a rotation system
    B. a continuous land use system
    C. an alternate period land use system
    D. usually the most efficient land use system

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30. The major problem encountered when growing Christmas trees on better agricultural soils is:

    A. stunted growth
    B. weed and grass competition
    C. poorly formed trees
    D. less insect and disease tolerance

31. Of the following factors, the most important when determining tree spacing is:

    A. type of mowing and spraying equipment to be used
    B. the species of tree
    C. climate
    D. soil fertility

32. Of the following tree species, the one which holds its needles best after cutting is:

    A. Norway spruce
    B. Balsam fir
    C. Douglas fir
    D. Scotch pine

33. Of the following Christmas tree characteristics the least important when selecting a species to grow is:

    A. shape
    B. density
    C. sharpness of needles
    D. rate of growth

34. Christmas tree seedlings can be planted in the fall if:

    A. a mild winter is expected
    B. the ground is bare
    C. the soil is coarse-textured
    D. ground preparation can be accomplished

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35. The most important precaution to observe while planting Christmas trees is to:

A. keep the rows straight
B. keep the spacing between trees uniform
C. keep the tree roots moist at all times
D. root prune the tree before planting

36. Fall planting of Christmas tree seedlings in northerm climates is usually not recommended due to the problem of:

A. wildlife feeding on the seedlings
B. frost-heaving of the seedlings
C. freezing of the seedlings
D. ice and snow damage

37. Chemical grass and weed control around Christmas trees is usually accomplished using.

A. simazine or amizine
B. malathion
C. diazinon
D. copper sulfate

38. Shearing of Christmas trees should begin:

A. when the growing season begins
B. after new growth has fully developed
C. in early autumn
D. in mid-winter

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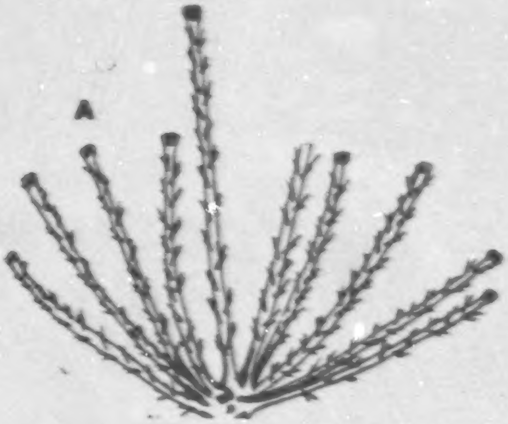
39. The diagram below which indicates the proper method of pruning the terminal whorl is:

A



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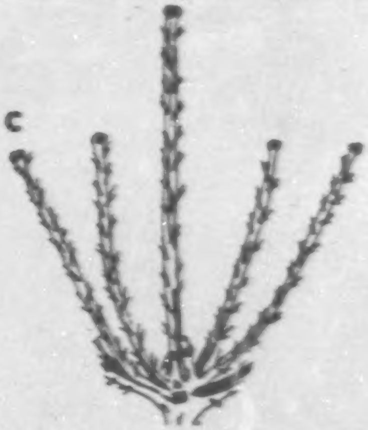

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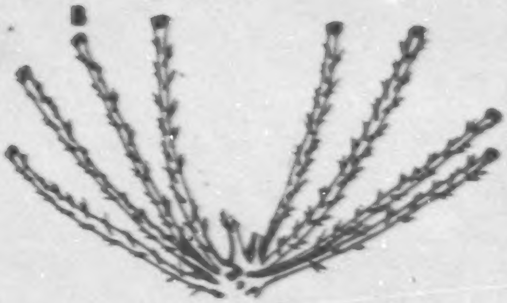

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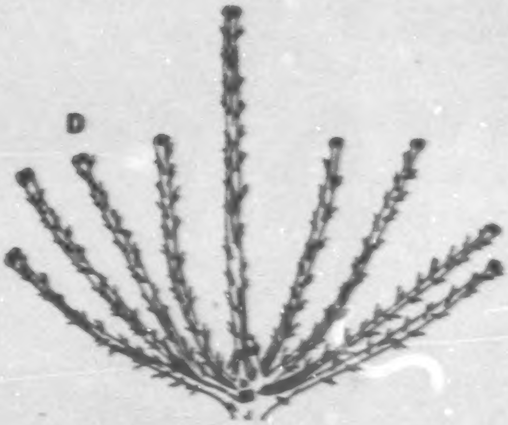

40. Side shearing of Christmas trees:

A. should begin 5-6 years after planting
B. involves cutting the second and third year growth of the tree
C. should be done with upward strokes of the shearing knife
D. should result in a taper of from 65-75 percent on most trees

41. Unmarketable trees should be culled from the Christmas tree plantation:

A. when the trees obtain a height of from 6 - 8 feet
B. when the entire area is harvested
C. 3 - 4 years after planting
D. one year after planting

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42. Cut Christmas trees dry out less:

A. if they are leaned against something
B. if they are sheltered from the wind
C. if they are laid flat on the ground or are flat-bulk piled
D. both B and C are correct

43. The best information concerning identification and control of insects and diseases infesting Christmas tree stands is usually available through the:

A. Soil Conservation Service
B. Agricultural Stabilization and Conservation Service
C. Cooperative Extension Service
D. National Hardwood Association

44. The most successful marketing of Christmas trees is:

A. consignment marketing
B. cut-your-own tree marketing
C. usually accomplished by making contacts with potential buyers in early summer
D. through grower retailing

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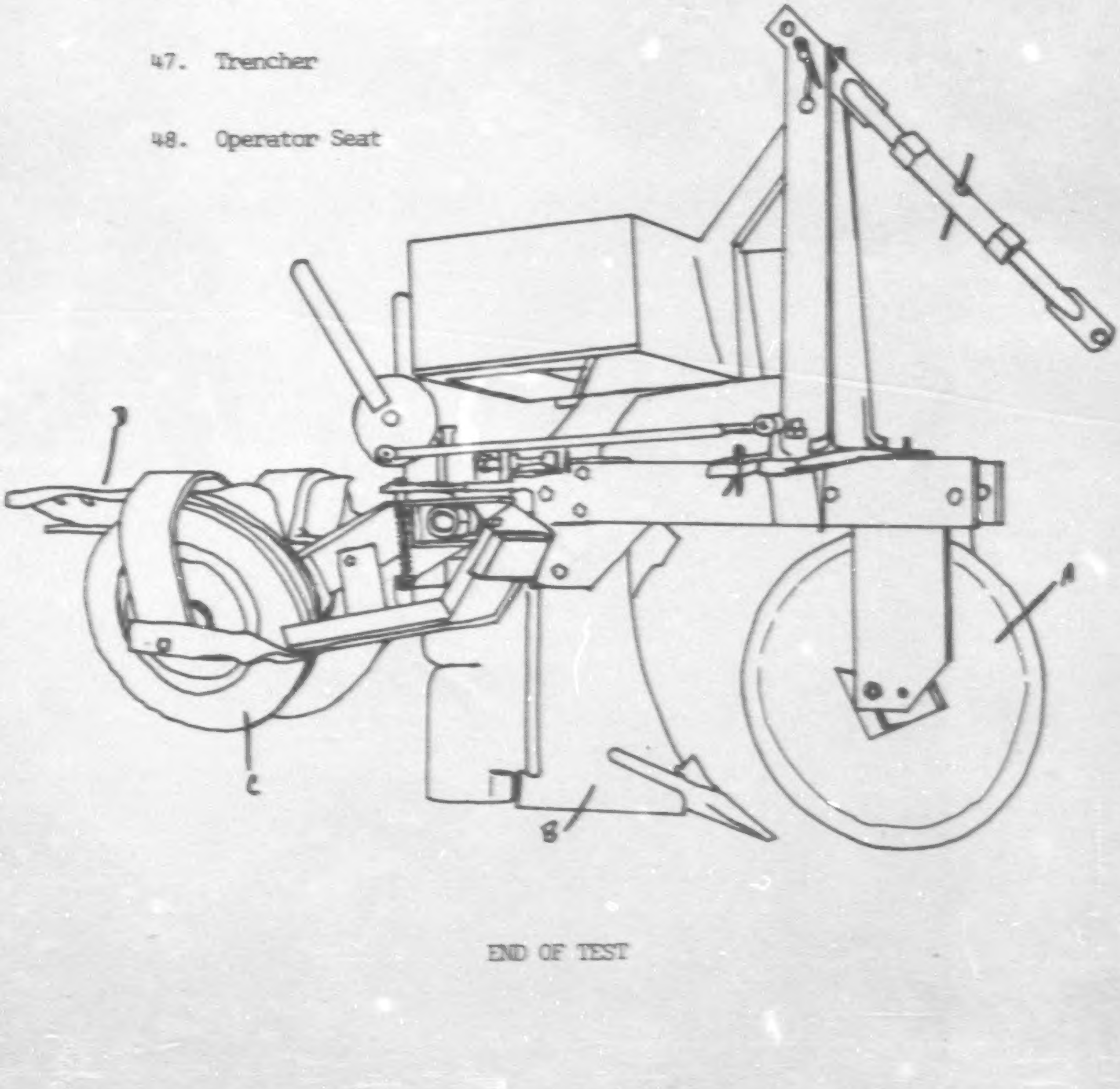
From the diagram below, indiate the letter of the tree seedling transplanter part which corresponds with the name listed below.

45. Packing Wheel

46. Coulter

47. Trencher

48. Operator Seat



END OF TEST

TABLE: 7-8 A
AREA: Forestry
TEST NO.: 7-8
KUDER-RICHARDSON 20: .647
KUDER-RICHARDSON 21: .571
N(tests) = 44

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	D	.318	.898	.488	53.8
2.	C	.659	.853	.470	50.6
3.	B	.636	.172	.112	10.9
4.	A	.750	-.661	-.239	-23.1
5.	D	.864	-.172	-.150	-7.1
6.	C	.455	.685	.203	36.5
7.	C	.500	.426	.299	27.6
8.	B	.614	.172	.111	10.9
9.	C	.750	-.094	.018	-5.8
10.	B	.523	.946	.521	67.9
11.	A	.614	.309	.212	19.2
12.	D	.773	.031	.050	1.9
13.	B	.614	.898	.422	59.6
14.	D	.636	.985	.649	75.0
15.	B	.545	.187	.003	11.5
16.	D	.545	.309	.254	19.9
17.	D	.318	.078	.144	5.1
18.	C	.545	.426	.155	27.6
19.	B	.364	.844	.462	52.6
20.	D	.591	.426	.292	27.6
21.	B	.636	.309	.186	19.9
22.	A	.636	.172	.038	10.9
23.	B	.636	.898	.510	59.6
24.	C	.341	.707	.413	37.2
25.	A	.727	.625	.298	25.6
26.	B	.886	.368	.173	17.3
27.	D	.864	.031	-.008	1.3
28.	D	.750	.905	.522	59.0
29.	A	.773	-.094	-.099	-5.8
30.	B	.364	.760	.425	44.2

TABLE: 7-8 A
AREA: Forestry
TEST NO.: 7-8

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
31.	A	.773	.324	.231	17.9
32.	D	.614	.187	.165	11.5
33.	D	.886	.324	.145	8.3
34.	C	.886	.218	.047	9.0
35.	C	.682	.905	.545	59.0
36.	B	.795	.172	.084	10.3
37.	A	.818	.368	.203	17.3
38.	B	.750	-.309	-.239	-14.7
39.	D	.523	.426	.182	27.6
40.	D	.818	.309	.133	18.6
41.	C	.705	.440	.263	26.3
42.	D	.386	.898	.419	53.8
43.	C	.682	.960	.487	66.7
44.	C	.773	.309	.294	18.6
45.	C	.182	.800	.490	38.5
46.	A	.318	.707	.402	37.2
47.	B	.182	.249	.109	14.1
48.	D	.068	.426	.155	15.4
49.					
50.					

AREA: FORESTRY

Unit: Scaling and Grading Saw Logs

Student Performance Objectives

The student should be able to:

1. Using bark or wood characteristics, identify the species of logs with 100% accuracy.
2. Using a yardstick and a log volume table commonly used in the area or a log scale stick, determine the number of board feet in a log within ± 2% and record the results in a tally book.
3. Using U.S. Forest Service guidelines, determine the use class and grade of hardwood and/or softwood saw logs with accuracy which will meet mill standards.

AREA: FORESTRY

Unit: Scaling and Grading Lumber (7-11)

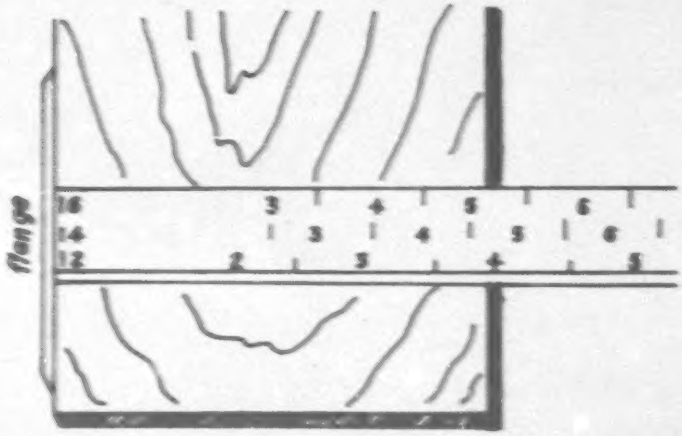
1. The number of board feet in a board can be determined by using the following formula:

   A. $$\frac{\text{Width in Inches} \times \text{Length in Feet}}{\text{Thickness in Inches}}$$

   B. $$\frac{\text{Thickness in Inches} \times \text{Length in Feet}}{\text{Width in Inches}}$$

   C. $$\frac{\text{Thickness in Inches} \times \text{Width in Inches} \times \text{Length in Feet}}{12}$$

   D. $$\frac{\text{Thickness in Inches} \times \text{Width in Inches} \times \text{Length in Inches}}{12}$$



2. If the board in the above drawing is 16 feet long, the number of board feet in the board is:

   A. 5
   B. 4
   C. 6
   D. 5-1/2

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3. If the board in the previous drawing is 12 feet long and 2 inches thick, the number of board feet in the board is:

A. 4
B. 6
C. 8
D. 10

4. A cutting from a hardwood board with one side free of all defects except for minor seasoning checks is called a:

A. sound cutting
B. free cutting
C. clear cutting
D. clear face cutting

5. Hardwood lumber that is between 1 and 1-3/4 inches thick is classified as miscut if:

A. it varies more than 1/4 inch between its thickest and thinnest point
B. it varies more than 1/3 inch between its thickest and thinnest point
C. there is more than 1-1/2 feet of wane on the board
D. both B and C are correct

6. The surface measure (sm) of a board is:

A. determined by the formula $\frac{\text{width in inches x length in feet}}{12}$
B. the same as the number of board feet in a 1 inch thick board
C. the same as the number of units in a 1 inch thick board
D. both A and B are correct

7. A select or FAS one face hardwood board is graded on:

A. the worst side
B. the best side
C. either side

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8. A portion of a hardwood board or plank that would be obtained by cross-cutting, ripping, or both is called a:

   A. unit
   B. cutting
   C. cutting unit
   D. slab

9. A lengthwise separation of wood which occurs usually between and parallel to the annual growth rings is called:

   A. split
   B. burl
   C. shake
   D. pith split

10. Softwood lumber used for general construction in which the entire piece is used is classified as:

    A. yard lumber
    B. structural material
    C. factory lumber
    D. shop lumber

11. Of the following softwood lumber grades, the one which would not be categorized as a yard lumber grade is:

    A. finish or select
    B. common
    C. structural
    D. dimension

12. Pine lumber is usually graded:

    A. on the worst side
    B. on the best side
    C. on either side
    D. using the same grades as in hardwood lumber grading

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13. A dry lumber scale stick differs from a green lumber scale stick in that:

    A. the marks on a green lumber scale stick will be farther apart than on a day stick
    B. the marks on a dry lumber scale stick are farther apart than on a green stick
    C. the dry lumber scale stick allows for shrinkage while the green stick does not
    D. there is no difference between the 2 types of lumber scale sticks

14. FAS grade refers to:

    A. first grade lumber with stain present
    B. firsts and seconds
    C. first standard grade
    D. a special grade for yellow poplar lumber

15. A board 6 inches wide and 12 feet long contains:

    A. 2 units
    B. 36 units
    C. 72 units
    D. 84 units

16. Bark, or the lack of wood on the edge of a board, is referred to as:

    A. wane
    B. pith
    C. cambium
    D. scale

17. Of the following lumber defects, the one which is usually admitted in clear face cuttings is:

    A. warp
    B. wane
    C. splits
    D. season checks

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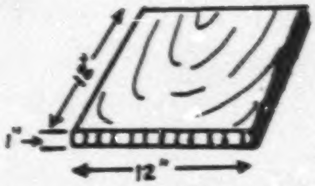
18. The poor face of a FAS one face or select hardwood board must grade at least:

A. FAS
B. no. 1 common
C. no. 2 common
D. no. 3A common

19. A separation of annual rings which is filled or partially filled with resin is called:

A. stain
B. mineral spots
C. birdseye
D. pitch pockets



20. The piece of lumber diagrammed above represents:

A. one unit
B. one square foot
C. one cubic foot
D. one board foot

21. A cutting from a hardwood board with sound firm knots and other minor defects is called a:

A. free cutting
B. clear cutting
C. sound cutting
D. clear face cutting

GO TO NEXT PAGE

22. 7/4 lumber is:

A. 1-3/16 inches thick
B. 1-3/4 inches thick
C. 1.75 inches thick
D. both B and C are correct

23. To make the FAS grade, a hardwood board must be at least:

A. 6 inches wide and 12 feet long
B. 4 inches wide and 12 feet long
C. 6 inches wide and 8 feet long
D. 8 inches wide and 10 feet long

24. A unit is equal to:

A. 1/6 of a square foot, surface measure
B. an area on a board 1 inch wide and 12 inches long
C. a section of a board 1 inch thick, 1 inch wide and 12 inches long
D. 1 square foot

25. The first step in grading a board is to:

A. determine the species
B. compute the number of board feet
C. determine the best side of the board
D. estimate the grade of the board

26. Of the following lumber defects, the one which would be described as a machine defect is:

A. birdseye
B. check
C. torn grain
D. wane

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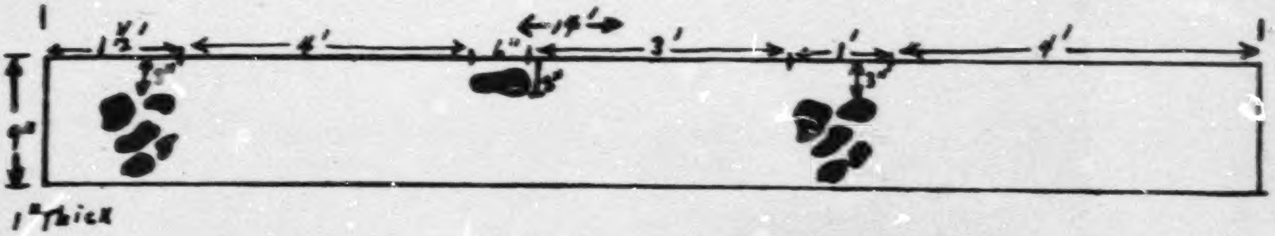
SIMPLIFIED HARDWOOD STANDARD LUMBER GRADES

	FAS	SELECTS	1 COMMON	2 COMMON	3 A	3B
WIDTH	6" +	4" +	3" +	3" +	3" +	3" +
LENGTHS	8' - 16'	6' - 8'	4' - 16'	4' - 16'	4' - 16'	4' - 16'
No. of cuttings allowed	$\frac{SM}{4}$	$\frac{SM}{4}$	$\frac{Sm + 1}{3}$ (not over 5)	$\frac{SM}{2}$ (Not over 7)	No limit	No limit
Minimum size of cuttings	4" x 5' or 3" x 7'	4" x 5' or 3" x 7'	4" x 2' or 3" x 3'	3" x 2'	3" x 2'	1-1/2"x2'
Amount required CF cuttings	10/12	10/12 FAS good side--1 Com. or better on poor side	8/12	6/12	4/12	3/12 (sound cuttings)
PITH	Length in inches no greater than SM	Same as FAS	1/2 the length	No limit	No limit	No limit

Use the above table when necessary in answering the remaining questions.



27. The number of board feet in the above diagrammed hardwood board is:

A. 8.5 bd. ft.
B. 9.5 bd. ft.
C. 10.5 bd. ft.
D. 11.5 bd. ft.

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28. The surface measure (sm) of the hardwood board diagrammed on the preceding page is:

A. 8.5
B. 9.5
C. 10.5
D. 11.5

29. The total number of units in the same illustration of hardwood board is:

A. 116
B. 126
C. 132
D. 136

30. The grade of the hardwood board is:

A. no. 1 common
B. no. 2 common
C. 3A common
D. FAS

31. If the hardwood board is estimated to be of no. 2 common grade, the number of cuttings allowed would be:

A. 2
B. 3
C. 4
D. 5

32. If the hardwood board is estimated to be of no. 1 common grade, the number of units required in the clear face cuttings would be:

A. 80
B. 84
C. 88
D. 96

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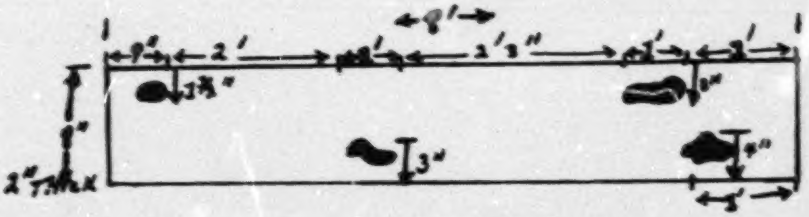
33. If the hardwood board from the previous illustration is estimated to be of FAS grade, the length of pitch in inches can be no longer than:

A. 5.5 inches
B. 7.5 inches
C. 9.5 inches
D. 10.5 inches



34. The number of board feet in the above diagrammed hardwood board is:

A. 8-2/3 bd.ft.
B. 9 bd. ft.
C. 10-2/3 bd.ft.
D. 11-1/2 bd.ft.

35. The surface measure (sm) of the above diagrammed hardwood board is:

A. 5-1/3
B. 6-2/3
C. 8-1/3
D. 10-2/3

36. The total number of units in the above diagrammed hardwood board is:

A. 56
B. 60
C. 64
D. 72

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37. The grade of the hardwood board illustrated on the preceding page:

A. FAS
B. select
C. no. 1 common
D. no. 2 common

END OF TEST

TABLE: 7-11
AREA: Scaling and Grading Lumber
TEST NO.: 7-11
KUDER-RICHARDSON 20: ____
KUDER-RICHARDSON 21: ____

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C				
2.	A				
3.	C				
4.	D				
5.	A				
6.	D				
7.	B				
8.	B				
9.	C				
10.	A				
11.	C				
12.	B				
13.	A				
14.	B				
15.	B				
16.	A				
17.	D				
18.	B				
19.	D				
20.	D				
21.	C				
22.	D				
23.	C				
24.	B				
25.	A				
26.	C				
27.	C				
28.	C				
29.	B				
30.	A				

TABLE: 7-11
AREA: Scaling and Grading Lumber
TEST NO.: 7-11

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
31.	D				
32.	B				
33.	D				
34.	C				
35.	A				
36.	C				
37.	D				
38.					
39.					
40.					
41.					
42.					
43.					
44.					
45.					
46.					
47.					
48.					
49.					
50.					

AREA: ENVIRONMENTAL PROTECTION

Unit: Water Sources and Uses

Student Performance Objectives

The student should be able to:

1. From a diagram of the hydrologic cycle, explain the cycle including how it relates to water supplies used by man, and each of the processes of precipitation, perculation or runoff, and evaporation.

2. Describe the major sources of surface water supplies and the safety of water from such sources.

3. List the advantages and disadvantages of ground water supplies.

4. Determine the water consumption rates in his local community, as calculated by community services or governmental agencies.

5. Identify the future problems of supplying water and how the supply is limited for the local conditions.

AREA: ENVIRONMENTAL PROTECTION

Unit: Water Sources and Uses (8-1)

1. Of the following water sources, the one which would be considered a surface water supply is a(n):

   A. artesian well
   B. spring
   C. stream
   D. deep well

2. Of the following water sources, the one which would usually require the most extensive treatment so as to be safe for human consumption is:

   A. a river
   B. a natural lake
   C. an impounding reservoir
   D. an artesian well

3. Of the total demand for water in most communities, the percentage that is used for domestic purposes is approximately:

   A. 25%
   B. 35%
   C. 45%
   D. 55%

4. The average amount of leakage in community water distribution systems is approximately:

   A. 1%
   B. 3%
   C. 10-15%
   D. 20-25%

5. Providing an adequate water supply in the future will be accomplished primarily by:

   A. demineralization of ocean water and other highly mineralized water
   B. developing fresh water supplies to their fullest extent
   C. decreasing the amount of pollution in present water supplies thereby making more water available
   D. limiting the amount of water households and industries may use

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6. Surface water supplies of water:

A. are safe for human consumption
B. must be aerated before they are safe for human consumption
C. are considered unsafe for human consumption unless chemically treated
D. are safe for human consumption unless they are turbid

7. The best way to find the daily, weekly, and monthly water consumption rates in a community is to:

A. determine what one household and one industry uses and multiply the answer by the number of each in the community
B. consult water treatment plants records
C. consult water pumping and reservoir water level records
D. both B and C are correct

8. Of the following conditions which affect the daily amount of water used in a community, the one having the greatest influence is:

A. the climate
B. the economic status of the people
C. the cost of the water
D. the quality of the available water

9. Potable water is water pure enough for:

A. use in toilets
B. swimming
C. drinking
D. showers

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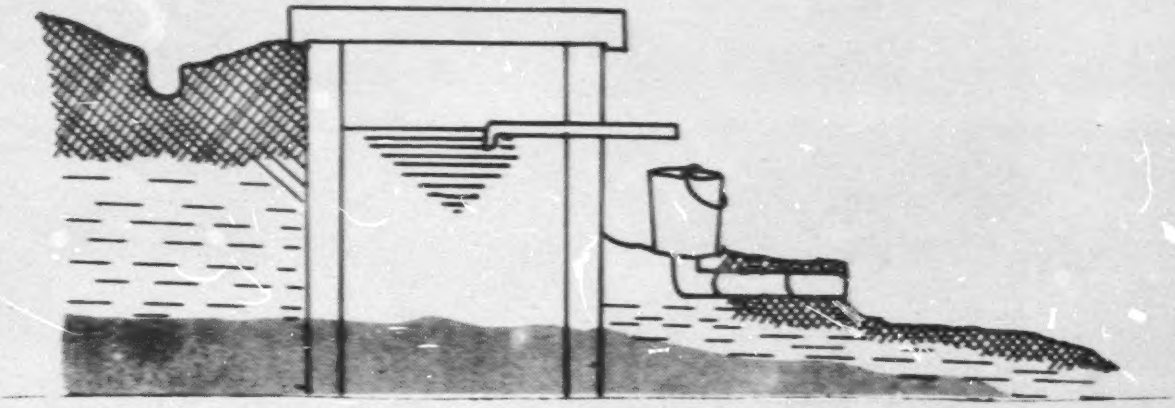

10. The water supply in the above diagram is:

    A. an artesian well
    B. a spring
    C. a water table well
    D. a cistern

11. Of the following water problems, the one which causes the greatest objections to underground water supplies is:

    A. the presence of harmful bacteria
    B. hardness
    C. odor
    D. turbidity

12. Of the following, the one which would be considered a source of "pure" water is a:

    A. spring
    B. river
    C. dug well
    D. none of the above

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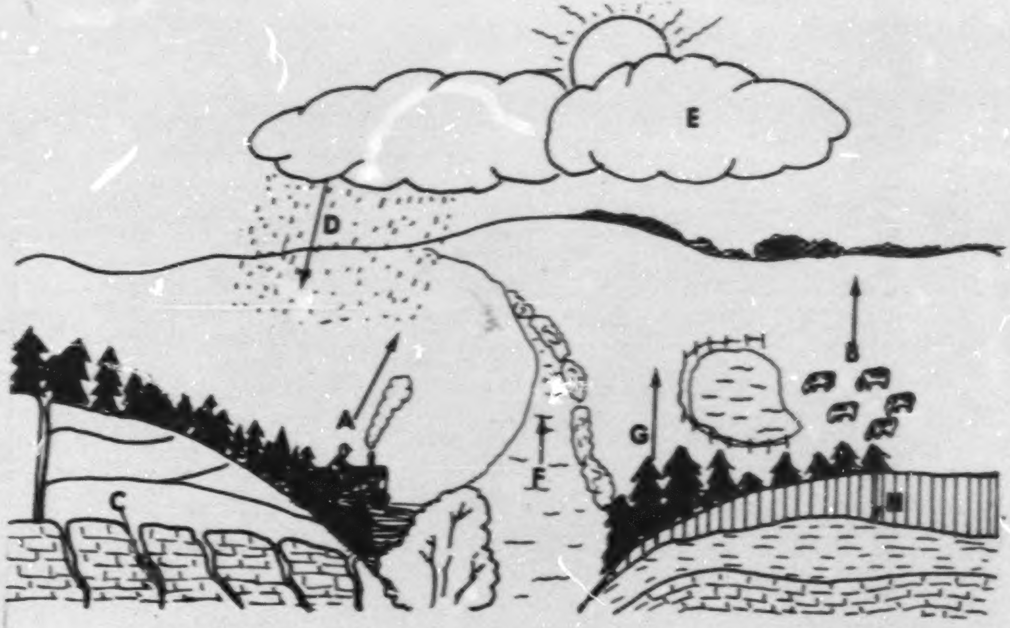

Indicate beside the following terms the corresponding letter of the correct process that is occurring:

13. Infiltration ____________

14. Condensation ____________

15. Respiration ____________

16. Precipitation ____________

17. Combustion ____________

18. Percolation ____________

19. Transpiration ____________

20. Evaporation ______ ____

END OF TEST

TABLE: 8-1 S
AREA: Environmental Protection
TEST NO.: 8-I
KUDER-RICHARDSON 20: .424
KUDER-RICHARDSON 21: .252

N(tests) = 100

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	C	.290	.869	.391	48.7
2.	A	.630	.740	.373	41.2
3.	C	.800	.411	.228	22.3
4.	C	.640	-.264	-.142	-15.9
5.	B	.690	.125	.082	7.5
6.	C	.510	.876	.398	57.6
7.	D	.180	.094	.089	5.4
8.	A	.510	.187	.202	11.7
9.	C	.370	.780	.323	41.8
10.	B	.770	.353	.149	20.5
11.	B	.670	.790	.389	45.6
12.	D	.730	.249	.162	15.3
13.	A	.720	.718	.373	33.6
14.	A	.190	.930	.499	56.5
15.	A	.340	.911	.475	58.3
16.	A	.010	.000	.017	00.0
17.	A	.180	.729	.343	31.3
18.	A	.670	.413	.339	28.3
19.	A	.370	.951	.500	67.9
20.	A	.300	.960	.468	65.2
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

AREA: ENVIRONMENTAL PROTECTION

Unit: Collection of a Water Sample

Student Performance Objectives

The student should be able to:

1. Describe the purpose and need for taking representative water samples, to the satisfaction of the instructor.

2. Properly collect a representative sample under various conditions for the laboratory.

   A. samples of raw water
   B. samples of treated water

3. Decide the frequency of sampling needed for water supplies from various sources

AREA: ENVIRONMENTAL PROTECTION

Unit: Collection of a Water Sample
(8-2)

1. The location of water sampling stations, types of samples, frequency, and time of day of collecting samples is influenced primarily by:

   A. the depth of the impoundment
   B. the overall objectives of the survey
   C. the size of the impoundment
   D. the type of pollutants found in the water

2. Of the following water characteristics, those which must be measured immediately upon taking the sample include:

   A. temperature and color
   B. pH and dissolved oxygen
   C. temperature and setteable solids
   D. color and pH

3. At a wastewater treatment facility, a "grab" or single catch sample would be taken when determining:

   A. nitrogen content
   B. BOD
   C. dissolved oxygen
   D. the amount of solids

4. When determining the location of sampling stations on a stream or river, the least important factor to consider is the:

   A. location of pollution sources
   B. location of tributaries
   C. physical characteristics of the stream
   D. type of sampling equipment used

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5. To be sure the sample that is taken from a stream or impoundment is not contaminated by anything left in the bottle.

   A. the sample bottle must be sterilized before the sample is taken regardless of the tests to be made
   B. a new bottle should be used for each sample
   C. the sample bottle should be rinsed in the water several times before the sample is taken
   D. the sample bottle should be treated with formaldehyde before sampling

6. A portion of water identical in content to that in the larger body of water being sampled is called:

   A. a selective sample
   B. a proportionate sample
   C. a representative sample
   D. a "grab" sample

7. A sample that is made up by combining portions of samples taken at regular intervals throughout a sampling period is best described as a:

   A. selective sample
   B. proportionate sample
   C. fixed sample
   D. composite sample

8. To preserve wastewater samples between sampling and analysis:

   A. sodium propionate should be added
   B. the sample should be kept at room temperature (72° F)
   C. sodium sulfonate should be added
   D. the sample should be refrigerated at less than 10° C

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9. When sampling the water in flowing streams or rivers, the most accurate method is to:

   A. take the sample from the same location along the bank each time
   B. take the sample from the center of the stream or river
   C. take samples of cross-sections of the stream or river
   D. take samples in a zig-zag pattern

10. The appropriate volume of water to be taken in a sample:

   A. is determined by the laboratory tests being made
   B. should include enough to allow for a retest of the sample
   C. should be at least one liter
   D. both A and B are correct

11. A weighted composite water sample is one in which:

   A. hourly samples are combined in proportion to the flow at the time the samples were taken
   B. hourly samples are combined in equal volumes
   C. hourly samples are combined in proportion to the time interval between collections
   D. hourly samples are combined in proportion to the number of samples taken each hour

12. A BOD test of a water sample:

   A. depends upon measuring the dissolved oxygen in the sample
   B. is often made on a sample that has been preserved with sulfuric acid
   C. determines the biochemical oxygen demand in the water
   D. all of the above are correct

13. Samples of a lake or large pond used for recreational purposes such as swimming and boating should be:

   A. taken one foot under the surface in the middle of the swimming area
   B. taken in the middle of the lake or pond
   C. composite samples
   D. none of the above correct

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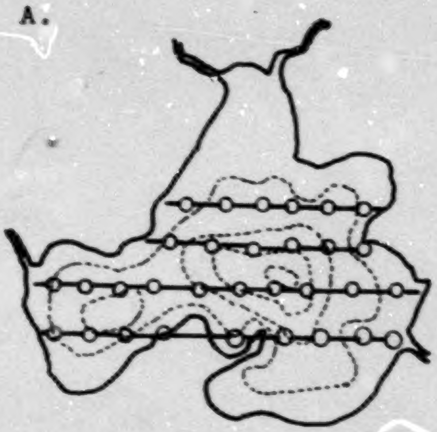
14. Water samples that are to be used for dissolved oxygen determination:

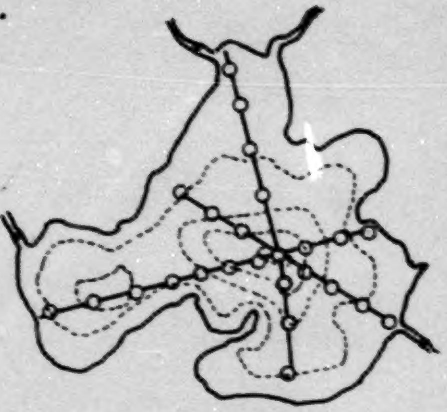
A. should be preserved by refrigeration at 10° C
B. should be tested on site
C. can be preserved using sodium thiosulfate
D. can be preserved using copper sulfate

15. The best location of sampling stations in a circular lake basin is indicated by:

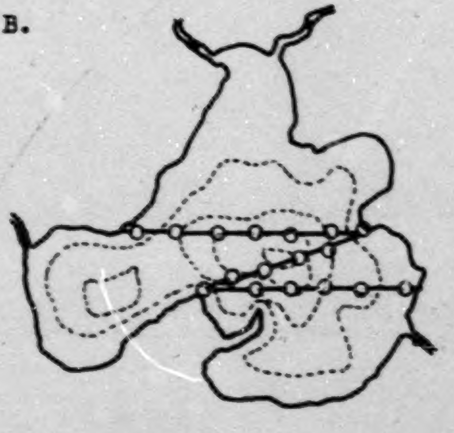
A.



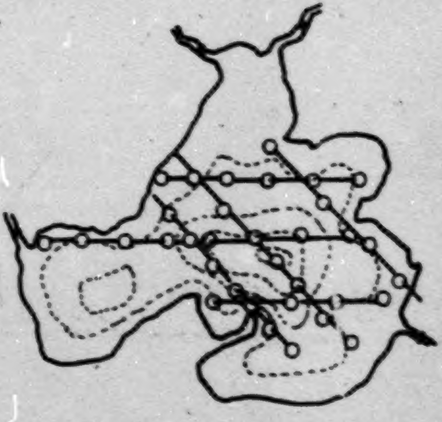
C.



B.



D.



END OF TEST

TABLE: 8-2 S
AREA: Environmental Protection
TEST NO.: 8-2
KUDER-RICHARDSON 20: .182
KUDER-RICHARDSON 21: .059

N(tests) = 46

Item	Correct Option	Relative Diffi-culty	Phi Coeff-icient	Point Biserial Coefficient	Discrim-ination Index
1.	B	.522	.718	.348	40.0
2.	B	.587	.729	.289	40.0
3.	C	.957	.353	.216	10.0
4.	D	.587	.309	.149	20.0
5.	C	.826	.000	-.021	00.0
6.	C	.674	.413	.263	30.0
7.	D	.783	.884	.367	50.0
8.	D	.565	.818	.355	50.0
9.	C	.652	.898	.523	60.0
10.	D	.413	.156	.109	10.0
11.	A	.804	.187	.210	10.0
12.	D	.783	.383	.311	20.0
13.	A	.870	.383	.187	20.0
14.	B	.391	---	.509	90.0
15.	C	.500	.905	.369	60.0
16.					
17.					
18.					
19.					
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30.					

AREA: ENVIRONMENTAL PROTECTION

Unit: Flow Measurement

Student Performance Objectives

The student should be able to:

1. Explain why flow measurement is necessary in a water treatment plant, to the satisfaction of the instructor.
2. List three types of measuring devices which are representative of those used in treatment plants.
3. Determine accurately the rate of flow in cubic feet per minute when provided with the size of the channel and the velocity of the water in feet per second.
4. Determine accurately the rate of flow in gallons per minute of water when the size of the pipe and the rate of flow in feet per second is provided.

AREA: ENVIRONMENTAL PROTECTION

Unit: Flow Measurement (Water Treatment Plants)
(8-3)

Indicate for each of the following terms the unit of measurement that corresponds with it.

1. Quantity

2. Pressure

3. Flow

4. Resistance to Flow

A. Head Loss
B. Cubic Feet
C. Pounds Per Square Inch
D. Gallons Per Minute

5. For small flows, the more accurate type of weir is the:

A. v notch weir
B. rectangular weir
C. round weir
D. square weir

6. The water in an open channel has been observed to flow 90 feet in 2 minutes. The channel is 2 feet wide and 18 inches deep. The rate of flow is:

A. 2.0 cfs
B. 2.25 cfs
C. 2.50 cfs
D. 2.75 cfs

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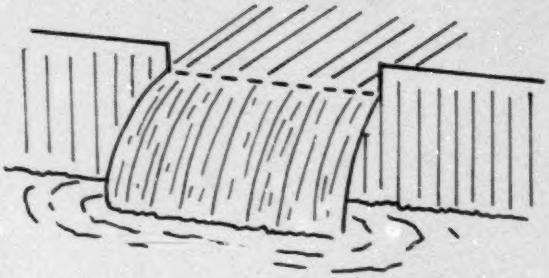
7. Water is flowing through a 12 inch diameter pipe at a velocity of 5 feet per second. The rate of flow is:

A. 1573.5 gpm
B. 1673.5 gpm
C. 1773.5 gpm
D. 1873.5 gpm



8. The water flow measurement device in the above diagram is a:

A. pershall flume
B. rectangular weir
C. flow meter
D. rate of flow controller

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9. The amount of energy that a unit quantity of water has at its location is referred to as:

A. pressure
B. head
C. mgd
D. velocity

10. Of the following measuring devices, the one not normally used to measure water flow in a water treatment plant is a:

A. v notch weir
B. venturi meter
C. head meter
D. parshall flume

11. The flow in a channel 18 inches wide and 8 inches deep has a velocity measured at 20 feet in 10 seconds. The flow in cubic feet per minute is:

A. 80 cfm
B. 100 cfm
C. 120 cfm
D. 150 cfm

12. Of the following, the one which is not a reason for flow measurement in a water treatment plant is:

A. to determine plant efficiency
B. to obtain records for the conditions under which the plant is operating
C. to determine costs of operation
D. to determine the amount of water used by individual consumers

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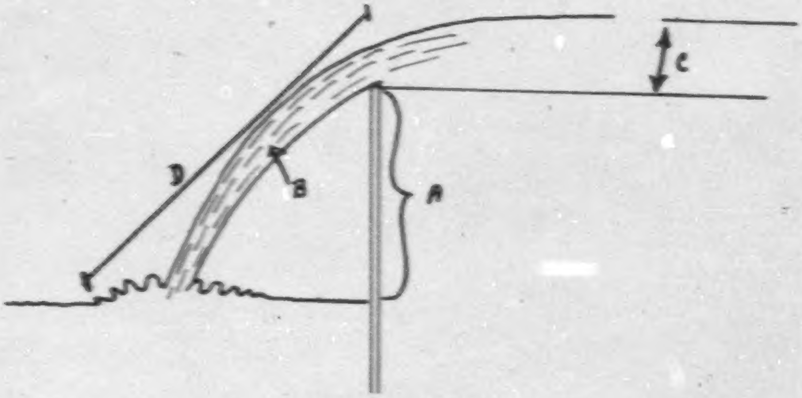

13. In the above diagram of a weir (cross-section), the head on the weir is indicated by:

    A.
    B.
    C.
    D.

14. The relationship between the volume of water flowing per unit of time, the velocity of the moving water, and the size of the pipe or channel is expressed by the equation.

    A. $V = \frac{Q}{A}$
    B. $Q = \frac{V}{A}$
    C. $Q = AV$
    D. $A = \frac{Q}{V}$

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15. Water is flowing through a pipe at the rate of 500 gpm. The output in gpd would be:

A. 500,000 gpd
B. 720,000 gpd
C. 800,000 gpd
D. 920,000 gpd

16. One basic difference between a venturi meter and a parshall flume is:

A. a venturi meter is less accurate
B. a venturi meter is more accurate when measuring water with debris and silt
C. a parshall flume measures water in open channels while a venturi meter does not
D. a parshall flume uses differences in pressure head to measure flow while a venturi meter uses depth of water

A. Static Head
B. Pressure Head
C. Velocity Head
D. Friction Head

For each of the following definitions, select the term from above which best describes it.

17. The loss of energy in a pipe or channel due to the contact of the liquid with the walls.

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18. Force per unit area such as pounds per square foot.

19. The vertical distance from some base level.

20. Energy in motion or kinetic energy.

END OF TEST

TABLE: 8-3

AREA: 8-3

TEST NO.:

KUDER-RICHARDSON 20:

KUDER-RICHARDSON 21:

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	B				
2.	A				
3.	D				
4.	C				
5.	A				
6.	B				
7.	C				
8.	B				
9.	B				
10.	C				
11.	C				
12.	D				
13.	C				
14.	C				
15.	B				
16.	C				
17.	D				
18.	B				
19.	A				
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AREA: ENVIRONMENTAL PROTECTION

Unit: Wastewater Facilities

Student Performance Objectives

The student should be able to:

1. Identify the importance of a familiarity with the wastewater collection and transportation network for a Wastewater Treatment Operator.
2. List three types of sewer systems and the advantages and disadvantages of each.
3. Describe the steps in the pretreatment process of wastewater and the purpose of each.
4. Describe the primary wastewater treatment process and its purpose.
5. Describe the secondary wastewater treatment process and its purpose.
6. Explain the purpose of disinfection and how it is best accomplished.

AREA: ENVIRONMENTAL PROTECTION

Unit: Wastewater Facilities (8-4)

1. A sewer designed to carry only wastewater from homes, businesses, and industries is called a:

   A. sanitary sewer
   B. combined sewer
   C. primary sewer
   D. primary influent sewer

2. Screening, shredding, and grit removal are examples of processes that occur during:

   A. tertiary treatment
   B. secondary treatment
   C. primary treatment
   D. pretreatment

3. Secondary treatment of wastewater consists primarily of:

   A. biological processes
   B. settling out of solid matter
   C. chlorination
   D. screening and shredding of coarse material

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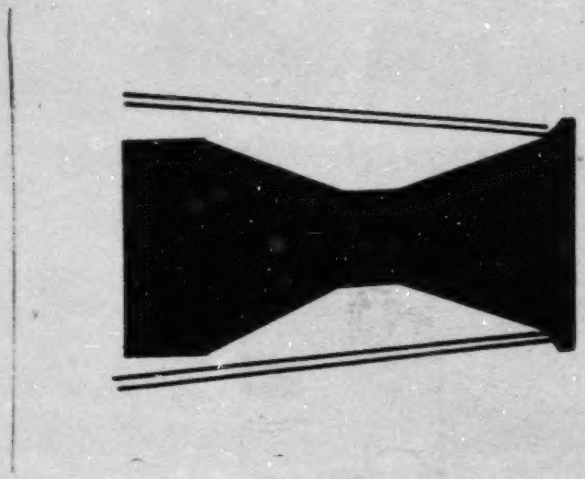

4. The device in the above diagram is a:

   A. rectangular weir
   B. v-notch weir
   C. parshall flume
   D. grit chamber

5. The device in the above diagram is designed to:

   A. remove settleable solids from the wastewater
   B. measure flow rates
   C. aerate the wastewater
   D. promote sedimentation in the wastewater

6. The "flights" or plows in a primary clarifier are designed to:

   A. slow down the wastewater flowing into the clarifier
   B. remove sludge and scum from the clarifier
   C. remove floating debris from the clarifier so it will not continue through the plant
   D. dissolve the solids in the wastewater

7. "Mixed Liquor" is the term for:

   A. the effluent from the activated sludge process
   B. the organisms and organic matter
   C. the sludge formed in the secondary clarifier
   D. raw sludge which has settled out in the primary clarifier

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8. "Acid formers" and "gas formers" refer to:

A. types of aerobic bacteria found in the digestion tank
B. types of anaerobic bacteria found in the trickling filter
C. types of anaerobic bacteria found in the digestion tank
D. types of aerobic bacteria found in the trickling filter

9. Disinfection of effluent from the wastewater plant is intended to:

A. kill all living organisms in the water
B. kill all pathogenic organisms in the water
C. sterilize the water
D. kill all parisitic organisms in the water

10. A wastewater treatment operator should be familiar with the entire wastewater system because:

A. he may be able to determine the source of problems in the plant influent
B. he may be asked to work on many parts of the system
C. he may be able to predict when to expect peak loads
D. both A and C are correct

11. Combined sewers present a problem to wastewater treatment facilities because:

A. they require pumping stations
B. they may cause untreated wastes to be discharged into the receiving waters
C. they usually have a higher rate of infiltration of ground water
D. they do not carry enough water to prevent development of hydrogen sulfide gas

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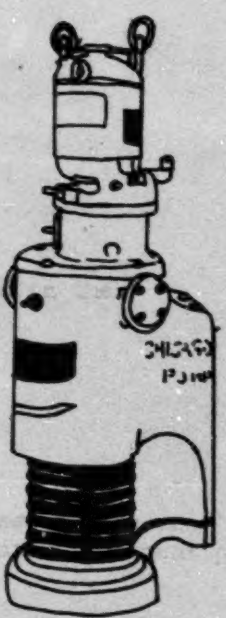

12. The mechanism in the above diagram is a:

    A. barminutor
    B. clarifier
    C. venturi meter
    D. comminutor

13. The mechanism in the above diagram is designed to:

    A. chlorinate
    B. aerate the wastewater
    C. measure rate of flow
    D. shred material in the wastewater stream

14. The trickling filter and activated sludge processes:

    A. occur during primary treatment
    B. are anaerobic biological treatment processes
    C. expose living organisms to the dissolved organic material
    D. kill and remove living organisms in the wastewater

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15. The digestion tank which digests settled sludge from the clarifiers:

A. contains aerobic bacteria
B. contains anaerobic bacteria
C. is maintained at approximately 140° F
D. both B and C are correct

16. Waste treatment ponds usually:

A. produce effluent much higher in bacteria than do treatment plants
B. produce strong odors if they are of the facultative type
C. produce effluent comparable to that from a modern waste treatment plant
D. do not require chlorination of the effluent even if the receiving waters are used for body contact sports

17. To disinfect water from a wastewater treatment plant, the most commonly used method is:

A. treat the water with liquid chlorine solution
B. treat the water with chlorine gas
C. treat the water with hypochlorite solution (bleach)
D. treat the water with chlorinated hydrocarbons

18. A problem which occurs when it takes a long time for wastewater to flow through the collection sewers to the treatment plant is:

A. odor problems
B. development of hydrogen sulfide gas
C. to make the wastes more difficult to treat
D. all of the above are correct

19. Primary treatment of wastewater consists primarily of:

A. biological processes
B. settling out of solid matter
C. chlorination
D. oxidation of organic matter

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20. A primary clarifier is designed to:

A. reduce flow velocity to about 3 feet per second
B. allow settleable solids to fall out of the wastewater
C. provide 4 to 6 hours of detention time
D. all of the above

21. Supernatent is produced in the:

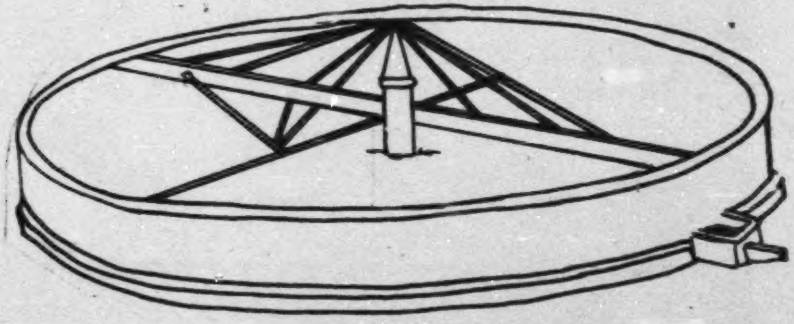
A. secondary clarifier
B. trickling filter
C. digestion tank
D. primary clarifier

22. Of the following processess, the one that would be considered a part of the tertiary wastewater treatment process is:

A. clarification
B. activated sludge
C. coagulation
D. disinfection

23. Gas produced in the digester is:

A. carbon monoxide
B. carbon dioxide and methane
C. hydrogen sulfide
D. nitrogen dioxide and sulfur



24. The unit in the diagram above is:

A. secondary clarifier
B. activated sludge unit
C. secondary clarifier
D. trickling filter

END OF TEST

TABLE: 8-4
AREA: 8-4
TEST NO.:
KUDER-RICHARDSON 20:
KUDER-RICHARDSON 21:

Item	Correct Option	Relative Difficulty	Phi Coefficient	Point Biserial Coefficient	Discrimination Index
1.	A				
2.	D				
3.	A				
4.	C				
5.	B				
6.	B				
7.	A				
8.	C				
9.	B				
10.	D				
11.	B				
12.	D				
13.	D				
14.	C				
15.	B				
16.	C				
17.	B				
18.	D				
19.	B				
20.	B				
21.	C				
22.	C				
23.	B				
24.	D				
25.					
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